THE OBSERVER'S
WORLD AIRCRAFT
DIRECTORY

WILLIAM GREEN

The Observer's World Aircraft Directory

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(*continued on back flap*

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THE OBSERVER'S
WORLD AIRCRAFT DIRECTORY

BY WILLIAM GREEN

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PREFACE

THE conception of *The Observer's World Aircraft Directory* probably owes as much to readers of the annual *Observer's Book of Aircraft* as to the writer, for its contents are based broadly upon the questions posed by the many letters which follow the publication of each successive edition of the smaller book. These questions vary widely, ranging from requests for information concerning aircraft not included in a particular year's *Observer's Book* to definitions of aeronautical terms or details of the composition of foreign air forces. Thus, the contents of this book also cover a wide range of subjects, for its aim is to provide in a single volume basic reference, not only to the multitude of aircraft types that are to be seen in the world's skies today, but to the air forces and air lines that operate them; to their power plants; to the insignia they carry; to the most important records that they have established, and to the bewildering aeronautical language that has grown around them.

Aviation is becoming an increasingly important part of our lives; dominating the military scene and playing a fast-expanding role in personal travel, and the language of aeronautics is growing with every new development. Rarely is it possible, nowadays, to pick up a newspaper or non-technical magazine containing no reference to aviation, and many aeronautical terms considered to be " technical " a few years ago are now a part of our everyday language. If one wishes to keep abreast of developments in aviation it is now necessary to build up an encyclopaedic knowledge of the subject—or possess innumerable works of reference. *The Observer's World Aircraft Directory* has been designed to serve as a one-volume reference library; a guide to the many aspects of aviation today for the flying enthusiast young or old.

The aircraft described and illustrated in the last one hundred and forty pages of the book have been arranged in broad structural groups which will, it is hoped, facilitate, with the aid of the foredge guide, the rapid identification of a particular aircraft type.

LONDON, MAY 1961 WILLIAM GREEN

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ALBANIA. The Albanian Air Force is a small defensive arm organised and equipped by the Soviet Union, and controlled and administered by the Albanian Army Command. The principal operational bases are Berat/Kucove, Durazzo/Shijak, Tirana and Valona, and there are believed to be only two operational squadrons, these being equipped with jet fighters. In addition, the Albanian Air Force possesses a flying training establishment and small transport and communications elements.

Fighter-bombers: MiG-15. *Transports:* Li-2, Il-14. *Liaison:* Yak-14, Po-2. *Trainers:* MiG-15UTI, Yak-11, Yak-18. *Helicopters:* Mi-1.

AFGHANISTAN. The Royal Afghan Air Force has received considerable assistance from the Soviet Union since the mid-'fifties, and the bulk of its current equipment is of Soviet origin. Afghan personnel have been trained in both the Soviet Union and India, and some Russian personnel are attached to the Air Force as instructors and advisers. There is one operational fighter wing based at Mazar-i-Sharif which base also houses advanced and operational conversion training elements; primary and basic flying training units are based at Sherpur, and other airfields include Herat, Jalalabad, and Kandahar. One attack bomber squadron has been in process of formation for some considerable time.

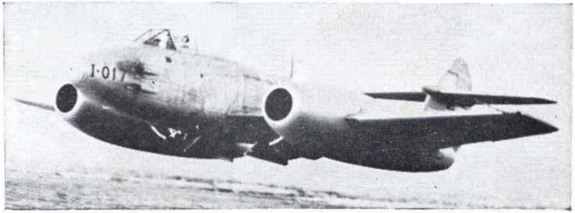
Interceptor Fighters: MiG-17. *Attack Bombers:* Il-28. *Transports:* Il-14, Avro Anson Mk. 18, An-2. *Helicopters:* SM-1. *Trainers:* MiG-15UTI, Yak-18.

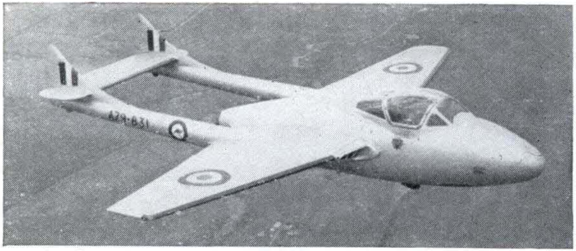
ARGENTINA. Military aviation in Argentina comprises the *Fuerza Aerea Argentina* (Argentine Air Force), the *Aviación Naval* (Naval Aviation), and a small Army Air Force, the last-mentioned arm being officially established on November 3, 1959, although the Argentine Army operated a number of aircraft prior to that date. The *Fuerza Aerea* is divided into Air Defence, Tactical, Strategic, Rescue and Transport commands, and all the combat elements and the bulk of the ancillary units are divided between five air brigades. These are *Air Brigada I* (El Palomar Base), Buenos Aires; *Air Brigada II* (General Urquiza Base), Entre Rios; *Air Brigada IV* (Plumerillo Base), Mendoza; *Air Brigada V* (Villa Reynolds Base), San Luis, and *Air Brigada VII* (Moron Base), Buenos Aires. In addition to formations attached to the major *Air Brigada* bases, there are *Destacamentos Aeronautico Militares* (Military Aeronautical Detachments) based at Mar del Plata, Rio Cuarto, Reconquista, Tandil, Chamical, Comodoro Rivadavia, Trelew, San Antonio Oeste, Rio Gallegos, and Puerto Deseado.

A Beech B-45 Mentor trainer of the Fuerza Aerea Argentina

Air Brigada I embodies the bulk of the Transport Command, including the 1st, 2nd and 3rd Transport Groups which operate C-54s, C-47s, Dove 1s, Bristol 170 Mk. 1s, I.A.-35-IIs, Viking IBs, and Lancastrians. The Lancastrians are used by the *Correo Aeronautico Militar* to carry diplomatic mail between Argentina and Uruguay, Paraguay, Peru, Chile and Bolivia. There is a basic training group at *Air Brigada I*'s El Palomar Base, this having been formed with twenty-four North American T-28A trainers received in January 1961. *Air Brigada II* at the General Urquiza Base includes the 1st Photographic Reconnaissance Squadron which is equipped with Fiat G.46 basic trainers, thirty of these having been acquired from Italy in the late 'forties, while *Air Brigada IV* embodies Fighter-bomber Groups I, II and III which operate the twenty-eight refurbished F-86F Sabres purchased from the

A Meteor F.4 of the F.A.A.'s Air Brigada VII at Moron





An Australian-built Vampire T.35 trainer of the R.A.A.F.

U.S.A. in the summer of 1960. M.S.760 Paris and I.A.35-Ia and Ib aircraft used for both policing duties and training are also deployed at *Air Brigada IV*'s Plumerillo Base. *Air Brigada V* operates the Bombing Group I equipped with the survivors of the dozen Lincoln heavy bombers obtained from the U.K. in 1946–47, and a number of transports, including Lancastrians. *Air Brigada VII* includes Fighter-Interceptor Groups I, II and III which each have a nominal strength of twelve Meteor F.4s, but of the 100 fighters of this type acquired in 1946–8, less than thirty are still airworthy.

CA-27 Sabres of the R.A.A.F.'s No. 78 Wing at Butterworth

The Military Aviation School uses the majority of the seventy-five B-45 Mentors assembled by the Fabrica Militar de Avions, these having now replaced the Percival Prentices. Other trainers employed by this school include the I.Aé.-DL-22, which is now being phased out in favour of thirty–forty North American T-28As, the M.S.760 Paris, and the AT-11 Kansan. These aircraft are included in the *Grupo Aereo Escuela*. The Detachment at Reconquista also operates a flying school with Fiat G.46s and B-45 Mentors. All I.Aé.-24 Calquin and I.Aé.-DL-22-C attack aircraft have now been withdrawn from service, and the Exploration and Attack Group I formed recently at Mar del Plata is being equipped with the I.A.-35-Ib. The Antarctic Squadron operates C-47s and DHC-2 Beavers, and the Sikorsky S-51 is employed for rescue duties. Twelve Sikorsky S-55 helicopters were obtained late in 1960, these being distributed among the major *Fuerza Aerea* bases.

Fighters: Gloster Meteor F.4. *Fighter-bombers:* North American F-86F Sabre. *Bombers:* Avro Lincoln B.1. *Observation:* I.A.-35-Ib. *Transports:* Avro Lancastrian, I.A.-35-II, Douglas C-47, Douglas C-54, Vickers Viking IB, Bristol 170 Mk. 1, de Havilland Dove 1. *Helicopters:* Sikorsky S-51, Sikorsky S-55. *Trainers:* North American T-28A, Fiat G.46, Morane-Saulnier M.S.760 Paris, Beech AT-11 Kansan, I.A.-35-I. *Utility:* De Havilland DHC-2 Beaver.

The *Aviación Naval* is controlled by the Chief of Naval Operations, and the importance of this force has grown considerably since Argentina's acquisition of an aircraft carrier, the A.R.A. *Independencia*, at the end of 1958. From U.S. Navy surplus, the *Aviación Naval* has acquired sixty-two F4U-5 and -5N Corsair fighter-bombers, these equipping Attack Squadrons I and II of *Escuadra Aeronaval No.* 2, Attack Squadron III of this unit being equipped with the North American SNJ-5C, thirty of which were obtained from the U.S.A. in 1958. *Escuadra Aeronaval No.* 2 is based, together with *Escuadra Aeronaval No.* 1, at the Comandante Espora Naval Air Base, Bahia Blanca, and *Escuadras Aeronavales Nos.* 3 and 4 are based at Punta de Indio, Buenos Aires, these being equipped with a variety of transport, general-purpose and training aircraft. Other naval air bases include Puerto Belgrano (Naval Aviation School); Puerto Madryn, Chubut; Rio Gallegos, Santa Cruz; Puerto Deseado, Santa Cruz; Fuerte Barragan, Buenos Aires; Ushuaia, Tierra del Fuego; Martin Garcia, River Plate, and Rio Grande, Tierra del Fuego. Six ex-R.A.F. P2V-5 Neptunes of Exploration Squadron I and the PBY-5A Catalinas and PBM-5A Mariners of Exploration Squadron II provide the backbone of the

Aviación Naval maritime reconnaissance force, and there is one helicopter squadron operating Bell 47Ds, Sikorsky HO4S-1s and Sikorsky HSS-1s. Two HO4S-1s are permanently based aboard the icebreaker A.R.A. *San Martin*. The most recent acquisition of the *Aviación Naval* is a batch of twenty Grumman F9F-2 Panther shipboard fighters which will eventually be based aboard the A.R.A. *Independencia*.

The Naval Aviation School uses SNJ-5Cs and Vultee BT-13s, and there is a Naval Air Transport Command comprising Transport Squadrons I and II with Douglas R4Ds and R5Ds, these operating a regular air transport service between Buenos Aires and Ushuaia. The *Aviación Naval* operates extensively in the Antarctic, and in 1960, a DHC-2 Beaver was acquired for use alongside two Beavers of the *Fuerza Aerea's Escuadron Antartica* during the Argentine Antarctic Expedition of the 1960–1 Antarctic summer. Co-operating with the *Aviación Naval* is the Coast Guard force of the *Prefectura Nacional Maritima* which operates the Grumman Goose and the Nord 1203 Norecrin.

Fighters: Grumman F9F-2 Panther. *Fighter-bombers:* Chance Vought F4U-5 and -5N Corsair. *Maritime Reconnaissance:* Lockheed P2V-5 Neptune, Convair PBY-5A Catalina, Martin PBM-5A Mariner. *Transports:* Douglas R4D, Douglas R5D. *Trainers:* North American SNJ-5C, Vultee BT-13. *Helicopters:* Bell 47D, Sikorsky HO4S-1, Sikorsky HSS-1. *Miscellaneous:* Grumman JRF Goose, Nord 1203 Norecrin, Beech AT-11 Kansan, de Havilland DHC-2 Beaver.

Created on November 3, 1959, the Army Air Force undertakes air observation post and liaison duties, and the training of parachutists. The formation of this arm was met by considerable opposition from political factions and the *Fuerza Aerea*, and although it was proposed that the Army Air Force should be responsible for all aerial transportation of troops, a rôle for which six DC-3s and six DC-3Cs were purchased from Real Aerovias Brazil in September 1960, it was eventually decided that troop transportation should be the concern of the *Fuerza Aerea*, and the twelve transports are being operated by this service. Three C-47s are used by the Army Parachutists' School at Cordoba, and the only other twin-engined equipment consists of five Piper Apaches, a Cessna 310, and three C-45Hs acquired in 1959. The Army also has eleven Piper L-21s, a Cessna 180 and a number of I.Aé.20 Boyero and Piper L-4 air observation post aircraft.

Transports: Douglas C-47, Beech C-45H. *Liaison:* Piper Apache, Cessna 310. *A.O.P.:* Piper L-21, Piper L-4, I.Aé.20 Boyero, Cessna 180.

AUSTRALIA. Australian military aviation comprises the Royal Australian Air Force, the Fleet Air Arm, and a small Army Air Corps whose aircraft are serviced and maintained by the R.A.A.F. There is also a Citizen Air Force, the five squadrons of which have now been relegated to a non-flying status, concentrating on the training of reservists. The R.A.A.F., which celebrated its Fortieth Anniversary on March 31, 1961, has a personnel strength of 15,750 officers and men. Its operational strength comprises three CA-27 Sabre fighter-bomber squadrons (Nos. 3, 75 and 77); three G.A.F. Canberra B.20 light bomber squadrons (Nos. 1, 2 and 6); two maritime-reconnaissance squadrons, one (No. 10) equipped with Lincoln M.R.30s, and the other (No. 11) equipped with P2V-5 Neptunes; three transport squadrons, one (No. 36) equipped with twelve C-130A Hercules transports, and the others (Nos. 30 and 38) equipped with Douglas C-47s, and an air observation post flight. A fourth fighter-bomber squadron (No. 76) is being formed with the permanent R.A.A.F. personnel previously attached to the Citizen Air Force squadrons, and a squadron of eight helicopters is to be formed. The G.A.M. Dassault Mirage III has been selected as a replacement for the CA-27 Sabre, and an initial order for thirty Mirages was placed late in 1960, and these will re-equip one squadron and an operational conversion unit. The Mirage airframe and engine are to be manufactured " to a substantial extent " in Australia, and it may be presumed, therefore, that further orders for this multi-purpose aircraft will be placed to re-equip all R.A.A.F. first-line units now flying the Sabre. The Lincoln M.R.30s of No. 10 Squadron are to be replaced between January and April 1962 by twelve P2V-7 Neptunes, and current plans call for the purchase of six more Hercules transports.

One of the Austrian Air Force's four Fiat G.46-5B trainers

Alouette IIs of Hubschraubergruppe I of the Austrian Air Force

Fighter-bombers: Commonwealth CA-27 Sabre Mks. 30, 31 and 32, de Havilland Vampire F.B.30. *Bombers:* G.A.F. Canberra B.20. *Maritime Reconnaissance:* Lockheed P2V-5 Neptune, G.A.F. Lincoln M.R.30. *Transports:* Lockheed C-130A Hercules, de Havilland DHC-2 Beaver, de Havilland DHC-3 Otter, Bristol 170 Mk. 21E, Douglas C-47, Convair 440 Metropolitan. *Trainers:* Commonwealth CA-25 Winjeel, de Havilland Vampire T.33 and T.35, Gloster Meteor F.8. *A.O.P.:* Auster A.O.P. Mk. 6.

Australia's Fleet Air Arm, which has been built up around the carriers H.M.A.S. *Sydney* and H.M.A.S. *Melbourne*, is to be wound up in 1963 owing to the prohibitive cost of acquiring a new carrier large enough to accommodate the latest shipboard aircraft when the existing Gannets and Sea Venoms reach the end of their service lives. At the present time, H.M.A.S. *Melbourne* is the flagship of the Australian Navy, and accommodates Nos. 816 and 817 Squadrons with Gannet A.S.4 anti-submarine aircraft, and No. 808 Squadron with Sea Venom F.A.W.53 fighters. H.M.A.S. *Sydney* serves as a training carrier, and several squadrons are based permanently at Nowra, including Nos. 805 and 851 concerned with pilot training, fleet requirements and target-towing, No. 724 Squadron which serves as an operational training unit, and No. 723 Squadron with Sycamore helicopters.

Fighters: De Havilland Sea Venom F.A.W.53. *Anti-submarine:* Fairey Gannet A.S.4. *Helicopters:* Bristol Sycamore H.R.50 and 51. *Trainers:* De Havilland Vampire T.34 and T.35, Fairey Firefly T.5 and A.S.6, Hawker Sea Fury F.B.11. *Transports:* Douglas C.47. *Liaison:* Auster Autocar.

The Australian Army's Air Corps is restricted to operating aircraft of under 2,500 lb. weight, and its equipment is serviced and maintained by the R.A.A.F. but flown by Army pilots. Eight Cessna 180s were acquired in 1959 to re-equip the A.O.P. wing at Canberra, and eleven Bell 47G-2 utility helicopters were purchased in 1960 to form part of the equipment of a new unit, No. 16 Light Aircraft Squadron. This is a joint Army/R.A.A.F. unit and will also operate Cessna 180s. The Australian Army has expressed a desire for a squadron of DHC-4 Caribou transports, but no waiving of the weight limitation on Army aircraft has yet been announced.

Liaison and A.O.P.: Cessna 180, Auster A.O.P. Mk. 7. *Helicopters:* Bell 47G-2.

AUSTRIA. The *Österreichischen Luftstreitkräfte*, or Austrian Air Force, is establishing its first operational *Jadgbomber-Staffel* with SAAB-29F fighter-bombers, fifteen of which were ordered from Sweden in November 1960. Austrian personnel are being trained in Sweden by the *Flygvapnet* to operate the SAAB-29Fs. The *Luftstreitkräfte* has a personnel strength of some 3,000 officers and men, and its training organisation comprises the *Jagdbomber-Schulstaffel* (Fighter-bomber Training Squadron) with three Vampire T.55s at Graz-Thalerhof and six C.M.170 Magisters, the *Schulkompanien* (School Company) with four Fiat G.46-5Bs, four Yak-11s, four Yak-18s, four Zlin Z.126s, two Piper PA-18 Super Cubs, and one Piaggio P.149, and the *Hubschrauber-Schulstaffel* (Helicopter Training Squadron) with four Agusta-Bell 47G-2s. The helicopter component of the *Luftstreitkräfte*, the *Hubschrauber-*

An F-84F-51-RE Thunderstreak of Belgium's 2nd Wing at Florennes

gruppe I, has ten Westland Whirlwinds and four SE-3130 Alouette IIs.

Fighter-bombers: SAAB-29F. *Helicopters:* Westland Whirlwind, Agusta-Bell 47G-2, Sud-Aviation SE-3130 Alouette II. *Liaison and A.O.P.:* SAAB-91 Safir, Cessna 182, Cessna 172, Cessna L-19A, Piper Cub. *Trainers:* Potez Air-Fouga C.M.170 Magister, de Havilland Vampire T.55, Fiat G.46-5B, Yak-11, Yak-18, Zlin Z.126, Piaggio P.149, Piper PA-18 Super Cub. *Transports:* De Havilland DHC-2 Beaver.

BELGIUM. The *Force Aérienne Belge* (Belgian Air Force) was brought into line with the air arms of Federal Germany and the Netherlands in 1960 with the decision to standardise on the F-104G Super Starfighter strike fighter as " part of the programme designed to limit the task of the Air Force to tactical support of the land forces". One hundred F-104Gs have been ordered for the *Force Aérienne*, and these are being manufactured by the Belgian aircraft industry, deliveries being scheduled to commence late in 1962, but it is anticipated that a total of 170 F-104Gs will eventually be required.

At the present time, the *Force Aérienne* possesses one all-weather fighter wing, one day fighter wing, two fighter-bomber wings, a surface-to-air missile wing, and a transport wing. The 1st All-weather Interceptor Wing based at Beauvechain comprises two squadrons each with twenty CF-100 Mk. 5 interceptors, the *349ème* and *350ème Escadrilles*; the 2nd Fighter-bomber Wing at Florennes has two squadrons each with twenty-five F-84F Thunderstreaks, the *1ère* and *2ème Escadrilles*; the 7th Day Fighter Wing at Chievres has two squadrons each with twenty-five Hunter F.6s, the *7ème* and *8ème Escadrilles*; the 10th Fighter-bomber Wing at Klein Brogel has three squadrons, the *23ème* and *31ème Escadrilles* with twenty-five F-84F Thunderstreaks each, and the *27ème Escadrille* (which is also the Operational Training Unit) with fifteen F-84F Thunderstreaks; the 13th Surface-to-Air Missile Wing at Elsenborn in Germany with four batteries of Nike-Ajax or Nike-Hercules missiles, and the 15th Transport Wing at Melsbroek. The last-mentioned Wing has only one squadron, the *20ème Escadrille* which operates thirty-five C-119Gs, twelve Pembroke C.51s, eight C-47As and C-47Bs, four DC-6As and two C-54Bs. There is also the *42ème Escadrille de Reconnaissance-Photographique* at Beauvechain with twelve RF-84F Thunderflashes, the *40ème Escadrille de Communications* at Melsbroek with Doves, Herons and two Sycamore H.R.14 helicopters, and the *Escadrille de Remorquage*, the target-towing unit, at Solenzana with some twenty-five Meteor F.8s.

Hunter F.6s of Belgium's 7th Day Fighter Wing at Chievres

One of the thirty M.S.760s of the Fôrça Aérea Brasileira

Forty-five Magister trainers were ordered jointly by Belgium and the Netherlands, and it was originally proposed that both Belgian and Dutch pilots should receive their training on these aircraft at Kamina in the Congo. However, events in 1960 following the declaration of Congolese independence, resulting in the evacuation of the Kamina base by the Belgians, necessitated the abandonment of this plan. The Magisters have since been delivered to Belgium where, from August 1961, both Belgian and Dutch pilots are to receive training. This is to be undertaken at Bursthem, near Hasselt, Belgian and Dutch pupils completing 150 hours on the Magister. The Belgian Army operates a number of helicopters and light

One of three two-seat Sea Fury conversions of the U.B.A.F.

aircraft, and has received twenty-seven Alouette II helicopters and 150 Piper L-18C light aircraft which were supplemented in 1960 by twelve Do 27s for the *15ème Escadrille d'Observation Légère*. The *Force Navale Belge* has received four S.58 helicopters from France. The *Force Aérienne* has received 197 F-84Fs, twenty-four RF-84Fs and fifty-three CF-100 Mk. 5s. The Belgian S.A.B.C.A. and Avions Fairey concerns built 100 Hunter F.4s and ninety-two Hunter F.6s, sixty-four of the F.4s being later brought up to F.6 standards. Personnel strength is approximately 23,000 officers and men.

Fighters: Avro CF-100 Mk. 5, Hawker Hunter F.6. *Fighter-bombers:* Republic F-84F Thunderstreak. *Reconnaissance:* Republic RF-84F Thunderflash. *Transports:* Douglas C-47A and C-47B, Fairchild C-119G, Hunting Pembroke C.51, Douglas C-54B, Douglas DC-6A. *Communications:* De Havilland Dove, de Havilland Heron. *Helicopters:* Bristol 171, Sycamore H.R.14, Sud-Aviation Alouette II, Sud-Aviation-built Sikorsky S.58. *Trainers:* Potez Air-Fouga Magister, Gloster Meteor T.7, Lockheed T-33A, Stampe SV-4B. *Liaison and A.O.P.:* Piper L-18C, Dornier Do 27. *Miscellaneous:* Gloster Meteor F.8, North American Harvard 2B.

The U.B.A.F. received several DHC-3 Otter transports in 1960

BOLIVIA. The *Fuerza Aérea Boliviano* (Bolivian Air Force) is a signatory to the Rio Pact of Mutual Defence but currently possesses no modern equipment, the most recent acquisition being four North American F-51D Mustang fighter-bombers purchased from the Uruguayan Air Force in 1960. A few Boeing-Stearman PT-17s were obtained from the Argentine Navy in 1958, and eighteen North American SNJ-6B trainers were received from the U.S.A. Relatively few of the F-47D Thunderbolt fighter-bombers and B-25J Mitchell light bombers supplied to Bolivia by the U.S. government in 1947–8 remain airworthy, and the *Fuerza Aérea* is now little more than a token arm. Personnel strength has suffered the ravages of political purges, and there is little likelihood of modern equipment being obtained owing to Bolivia's external debts.

Fighter-bombers: North American F-51D Mustang, Republic F-47D Thunderbolt. *Bombers:* North American B-25J Mitchell, Boeing B-17G Fortress. *Transports:* Douglas C-47. *Trainers:* North American T-6 Texan, North American SNJ-6B, Boeing-Stearman PT-17 Kaydet, Vultee BT-13, Beech AT-11.

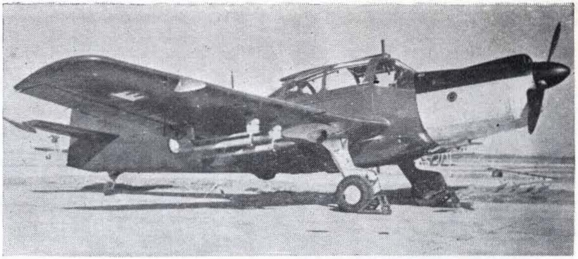
BRAZIL. The *Fôrça Aérea Brasileira* (Brazilian Air Force) is one of the largest air arms in Latin America but its equipment is largely obsolete. Sixty-two Meteor F.8 interceptors and Meteor T.7 conversion trainers were acquired in exchange for cotton in 1953–4, and these still equip the one operational interceptor group which comprises three squadrons of twelve aircraft. There are also two operational fighter-bomber groups equipped with the F-47D Thunderbolt, and two light bomber groups equipped with the B-25J Mitchell and B-26 Invader respectively. One maritime reconnaissance squadron is equipped with the P2V-7 Neptune, and the air/sea rescue squadron is equipped with fourteen former-U.S.A.F. SA-16A Albatross amphibians obtained in 1960. Other new equipment obtained by the F.A.B. during 1960 included twelve Bell 47G-2 Trooper helicopters and thirty M.S.760 Paris four-seat liaison aircraft. The F.A.B. operates an Air Force College at Campo dos Afonsos, a Tactical Air School at Cumbica, and technical schools at São Paulo and Guaratinquetá. There is a small naval air arm, but the F.A.B. has been responsible for the supply of pilots, crews and aircraft to the Brazilian Navy which possesses one carrier, the *Minas Gerais*. The *Minas Gerais* began operational patrols in the South Atlantic in May 1961, and the U.S. government donated six Sikorsky S-55 helicopters and twelve Grumman S2F-1 Tracker anti-submarine aircraft towards its equipment. Personnel for these aircraft have undergone training in the U.S.A. at the Key West, Florida, Naval Air Station.

Fighters: Gloster Meteor F.8. *Fighter-bombers:* Republic F-47D Thunderbolt. *Bombers:* North American B-25J Mitchell, Douglas B-26 Invader. *Maritime Reconnaissance:* Lockheed P2V-7 Neptune, Convair PBY-5A Catalina. *Helicopters:* Bell 47G-2 Trooper, Bell 47J, Sikorsky S.55, Westland Widgeon. *Anti-submarine:* Grumman S2F-1 Tracker. *Transports:* Fairchild C-82 Packet, Douglas C-47, Curtiss C-46, Beech C-45. *Liaison and Communications:* Morane-Saulnier M.S.760 Paris, Beech F-17D, Grumman JRF-6 Goose. *Trainers:* Fokker S-11 Instructor, Gloster Meteor T.7, Lockheed T-33A, Fairchild PT-19, Beech T-11, Vultee BT-13.

BULGARIA. The operational strength of the Bulgarian Air Force is believed to have remained constant in recent years, its size being reduced in 1957, owing to the country's strained economy, to two interceptor fighter regiments (each roughly equivalent in size to an R.A.F. Wing) and a light bomber and ground attack regiment. There are small primary, basic and advanced training elements, and communications and transport units. First-line strength is believed to comprise approximately 100 aircraft, and the principal operational types are the MiG-17 interceptor and the MiG-15 fighter-bomber.

Fighters: MiG-17. *Fighter-bombers:* MiG-15, Il-10. *Transports:* Li-2, An-2, Il-14. *Helicopters:* SM-1, Mi-4. *Trainers:* MiG-15UTI, LAZ-7M, Yak-18, Yak-11, Po-2.

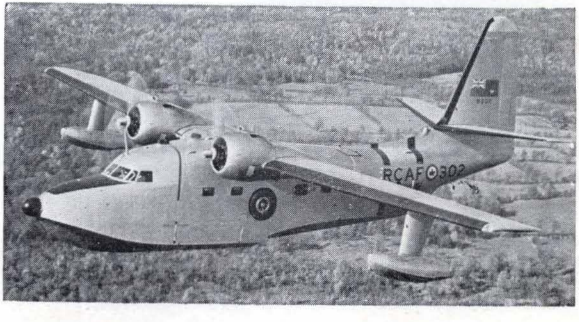
BURMA. The Union of Burma Air Force's main rôle is that of policing Burmese territory, particularly in the north and north-east where Burmese forces frequently encounter Communist guerillas. Forty Provost T.53s were acquired by the U.B.A.F. between 1954 and 1960, these being used for both training and policing duties. Some eight Vampire T.55s, obtained in 1954–5, are currently the only jet aircraft operated by the U.B.A.F. and equip one squadron. The transport element operates two Type 170 Mk. 31M freighters, six Beech D-18S light transports, and several C-47s and DHC-3 Otters, the last-mentioned aircraft being obtained in 1960. Two U.B.A.F. squadrons are equipped with reconditioned Sea Fury F.B.11 fighter-bombers, eighteen of which were purchased in 1957–8, together with three two-seat trainer conversions, and six Kawasaki-Bell 47s supplied from Japan under a reparations contract equip a helicopter flight. The U.B.A.F. possesses approximately 100 aircraft of all types, and its personnel strength is 900–1,000 officers and men.



Armed Morane-Saulnier M.S.733 Alcyon of Royal Khmer Aviation

Fighter-bombers: Hawker Sea Fury F.B.11, de Havilland Vampire T.55. *Helicopters:* Kawasaki-Bell 47. *Transports:* De Havilland DHC-3 Otter, Douglas C-47, Beech D-18S, Bristol 170 Mk. 31M. *Trainers:* Hunting Provost T.53, Hawker Sea Fury. *Liaison and A.O.P.:* Cessna 180.

A CSR-110 Albatross of the R.C.A.F.'s search and rescue flights



CAMBODIA. Known as Royal Khmer Aviation, Cambodia's air arm is concerned solely with internal policing, training and transport duties, and consists of several army co-operation, air observation post, and liaison flights, two transport flights and a Flying Training School at Pochentong. Fourteen M.S.733 Alcyon trainers were acquired from France for both training and policing rôles, and seven Toyo-built two-seat FD-25A and single-seat FD-25B light ground attack aircraft were received from Japan. Most Cambodian personnel have received their training in France or Algeria. In 1960, two SE-3130 Alouette II helicopters were purchased, and it is planned to acquire eight more for use in the liaison, reconnaissance and ambulance rôles.

CL-13A Sabre Mk. 5s of the R.C.A.F.'s "Golden Hawks" team

Policing and Attack: Morane-Saulnier M.S.733 Alcyon, Fletcher FD-25A and B Defender. *A.O.P.:* Cessna L-19 Bird Dog. *Transports:* Douglas C-47, de Havilland DHC-2 Beaver. *Helicopters:* Sud-Aviation SE-3130 Alouette II. *Trainers:* Morane-Saulnier M.S.733 Alcyon.

CANADA. The Royal Canadian Air Force currently possesses nine first-line all-weather interceptor squadrons based in Canada and equipped with the CF-100 Mk. 5 (Nos. 409, 410, 413, 414, 416, 425, 428, 432 and 433), and four all-weather squadrons equipped with the CF-100 Mk. 4B (Nos. 419, 423, 440 and 445) and eight day fighter squadrons equipped with the Sabre Mk. 6 (Nos. 421, 422, 427, 430, 434, 439, 441 and 444) based in Europe. The CF-100 Mk. 5s equipping the home-based squadrons are now approaching obsolescence, and it was originally proposed to base Canada's air defence policy on the IM-99B Bomarc surface-to-air missile, this weapon supplanting the manned interceptor. Successive failures of the Bomarc under test, and a U.S. decision to abandon a considerable proportion of this missile's development programme resulted, late in 1960, in discussions between the Canadian and U.S. governments concerning the supply of sixty-six McDonnell F-101B Voodoo fighters to equip a nucleus of all-weather interceptor squadrons after the withdrawal of the CF-100, and to serve as a stop-gap until operationally effective missiles become available. The re-equipment of eight R.C.A.F. squadrons of the 1st Air Division in Europe with the CF-104 (Canadian-built F-104G Super Starfighter) all-weather multi-purpose strike/reconnaissance aircraft is scheduled to commence before the end of 1961, two hundred CF-104s having been ordered from Canadair. The four CF-100 Mk. 4B squadrons currently based in Europe will be disbanded.

In addition to the twenty-one first-line fighter squadrons currently possessed by the R.C.A.F., there are two long-range maritime reconnaissance squadrons (Nos. 404 and 405) equipped with the CP-107 Argus, and one (No. 407) equipped with the P2V-7 Neptune. There is a substantial Air Transport Command comprising five squadrons, and in recent years these have received twenty-four C-54-GM North Stars, two Comet Series 1As, forty-eight Fairchild C-119s and four C-130B Hercules, and are in process of receiving twelve Canadair CC-106s and ten Canadair CC-109s. At the present time, No. 408 Squadron has photographic-reconnaissance Lancasters; No. 412 operates the two Comets together with the CC-109s and some C-47s; No. 426 Squadron operates CC-106s and North Stars; No. 435 Squadron has C-119s and the C-130B Hercules, and No. 436 Squadron operates C-119s.

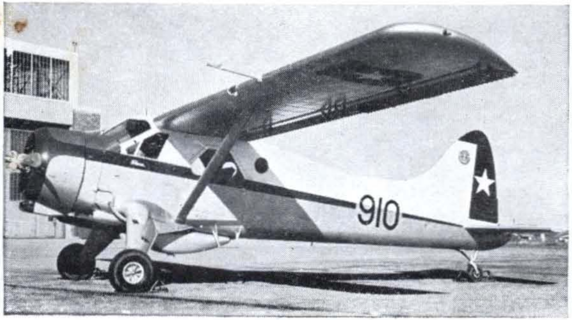
There are several communications flights equipped with the Beech C-45 Expeditor and the DHC-3 Otter, sixty-six of the latter having been delivered to the R.C.A.F. There are seven auxiliary squadrons (Nos. 400, 401, 406, 411, 438, 442 and 443) all of which are equipped with Expeditors and Otters for light transport duties. Ten Albatross amphibians were obtained late in 1960 for use with the R.C.A.F.'s extensive search and rescue organisation, two Vertol 44 helicopters also being delivered for search and rescue. Four CC-108 Caribou S.T.O.L. transports were acquired for service with the U.N. Emergency

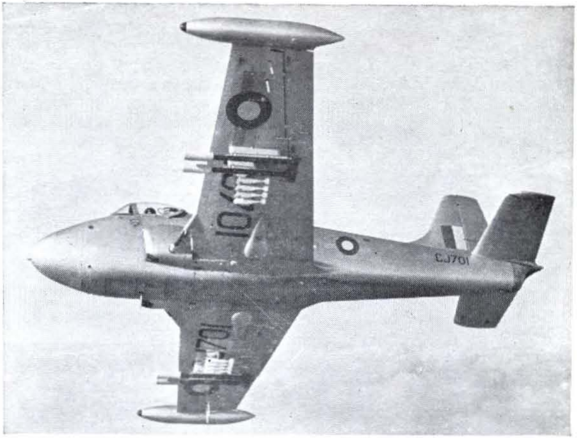
Force, these being manned by R.C.A.F. crews as are also the DHC-3 Otters which provide support for the U.N. in the Middle East.

Fighters: Avro CF-100 Mks. 4B and 5, Canadair CL-13 Sabre Mks. 5 and 6, Canadair CF-104 Super Starfighter. *Maritime Reconnaissance:* Canadair CP-107 Argus Mks. 1 and 2, Lockheed P2V-7 Neptune. *Search and Rescue:* Grumman CSR-110 Albatross, Canadair PBY-5A Canso. *Transports:* Canadair CC-106, Canadair CC-109, de Havilland CC-108 Caribou, Lockheed C-130B Hercules, Fairchild C-119G, Canadair CL-2 North Star, Canadair CL-5, Douglas C-47. *Communications:* Bristol 170 Mk. 31M, Beech C-45F Expeditor, de Havilland DHC-3 Otter. *Helicopters:* Vertol V-44, Vertol H-21A and C, Sikorsky H-19, Sikorsky H-34A. *Trainers:* Avro CF-100 Mks. 3-CT and -DT, Beech C-45F Expeditor Mks. 3T and 3N, Canadair T-33A-N Silver Star Mk. 3, C.C.F. Harvard Mk. 4, de Havilland DHC-1 Chipmunk T.30, North American TB-25D and TB-25J Mitchell. *Miscellaneous:* Avro Lancaster 10-PR.

The Royal Canadian Navy operates one aircraft carrier, H.M.C.S. *Bonaventure*, and seven air squadrons of which three are operational, these being VF 870 equipped with the F2H-3 Banshee shipboard fighter, thirty-nine of which were acquired from U.S. Navy squadron establishments in 1955; VS 880 equipped with twenty-four CS2F-2 Tracker anti-submarine aircraft, and HS 50 equipped with six Sikorsky HO4S-3 anti-submarine helicopters. The remaining four squadrons are HU 21 which operates four HO4S-3 and three HTL-6 helicopters, VU 32 with CS2F-1 and CS2F-2 Trackers, VU 33 with Trackers and two Vertol HUP-3 helicopters, and VX 10, an experimental squadron operating Trackers and Banshees. Although, until recently aircrew training was undertaken in the U.S.A., this is now completed entirely in Canada.

A DHC-2 Beaver utility aircraft of the Fuerza Aérea de Chile





An armed Jet Provost T.3 used for policing by the R.Cy.A.F.

Fighters: McDonnell F2H-3 Banshee. *Anti-submarine:* De Havilland (Grumman) CS2F-1 and -2 Tracker. *Helicopters:* Bell HTL-6, Sikorsky HO4S-3, Vertol HUP-3. *Miscellaneous:* Beech C-45F Expeditor, Canadair T-33A-N Silver Star Mk. 3.

The Canadian Army currently possesses a small air branch consisting primarily of two A.O.P. flights of five aircraft each. The Canadian Army reportedly requires some forty Boeing-Vertol 107 or similar helicopters, and is also interested in the CC-108 Caribou. Caribous are to be evaluated for the Army by the R.C.A.F., and twenty-one Hiller 12E helicopters are on order.

A.O.P.: Cessna L-19AL Bird Dog. *Helicopters:* Bell H-13.

CEYLON. The Royal Ceylon Air Force is principally concerned with preventing the entry of illicit immigrants, internal policing, light transport and inter-service co-operation, intermediate technical training, and operational and flying training. Twelve de Havilland Chipmunks and nine Boulton Paul Balliols were acquired to equip a training squadron, and in 1959 six Jet Provost T.3s were delivered, and an order placed for a further six aircraft of this type. The Jet Provosts are equipped with a machine-gun and racks for light bombs or rockets to suit them for the policing rôle, and it is anticipated that the R.Cy.A.F. will eventually operate some eighteen aircraft of this type from Katunayake. The R.Cy.A.F. operates four Pioneer C.C.1s, five Doves and four Herons, plus two Westland Dragonfly helicopters, for internal security, coastal patrol, communications and transport duties, and the Herons, delivered in 1959 and 1960, can each be fitted with bench-type seats for fifteen paratroops.

Transports: Scottish Aviation Pioneer C.C.1, de Havilland Heron, de Havilland Dove. *Helicopters:* Westland Dragonfly. *Trainers:* Boulton Paul Balliol T.2, Hunting Jet Provost T.3, de Havilland Chipmunk T. 21.

CHILE. The *Fuerza Aérea de Chile* (Chilean Air Force) possesses only one combat group equipped with F-80C Shooting Stars, B-26 Invaders and B-25J Mitchells, being primarily a training, transport and communications organisation. In 1960 plans were prepared for the operation of a regular transport service between Quintero and Easter Island, by the PBY-5A squadron, and twenty Beech 45 Mentor trainers were obtained to supplement the forty-five aircraft of this type previously purchased. The *Fuerza Aérea* is organised into four Air Brigades, and the principal bases are El Bosque, Los Cóndores, Cerro Moreno, Los Cerrillos, Quintero, Maquehue, Chamiza, Balmaceda, and Bahia Catalina, and there are numerous smaller airfields and strips along Chile's 2,800-mile length. The *Fuerza Aérea's* personnel strength is 5,000–6,000

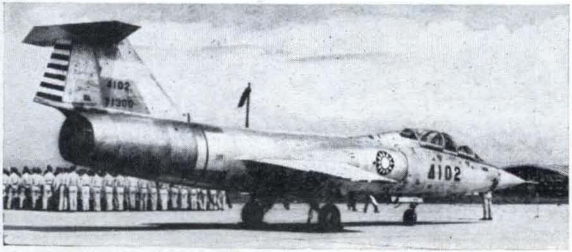
The Chinese People's Armed Forces Air Force has received 500 Il-28 light bombers such as those being " bombed up " below

officers and men. Jet training is undertaken within Group No. 7 at Los Cerrillos where five Vampire T.55s and a number of T-33As and F-80Cs are in service. The Tactical Air School at Los Cóndores operates T-6 Texans, the Wireless Operators and Technicians School is situated at Chamiza, and the Pilots' School and N.C.O. Specialist School are based at El Bosque. The C-45, C-47 and C-50 transports are operated by Group No. 10.

Fighter-bombers: Lockheed F-80C Shooting Star. *Bombers:* Douglas B-26 Invader, North American B-25J Mitchell. *Reconnaissance:* Convair PBY-5A. *Transports:* Douglas C-47, Douglas C-50, de Havilland DHC-3 Otter. *Helicopters:* Sikorsky S.55, Bell 47, Hiller 12E. *Trainers:* Beech 45 Mentor, Lockheed T-33A, de Havilland Vampire T.55, Beech D.18S, Vultee BT-13, Beech T-11B, North American T-6 Texan. *Communications and Liaison:* Beech Model 50 Twin Bonanza, de Havilland DHC-2 Beaver, Cessna 180. *Rescue:* Grumman SA-16A Albatross. *A.O.P.:* Cessna L-19 Bird Dog. *Photo Survey:* Beech D.18S.

CHINA (PEOPLE'S REPUBLIC). In the Chinese People's Armed Forces Air Forces, or C.P.A.F.A.F., the Chinese Republic possesses the world's third largest air arm. The total strength is 3,000 aircraft, the vast majority of which are jet powered, the backbone of the interceptor units being the MiG-17 which is manufactured under licence in China, current production rate being twenty machines per month, although a number of MiG-19 and MiG-21 supersonic fighters have been obtained from the Soviet Union. The C.P.A.F.A.F. possesses 2,000 jet fighters of all types. Some interceptor regiments are still equipped with the obsolescent MiG-15, but most aircraft of this type now serve with the close support units. The bomber regiments are equipped with the Il-28, 500 of which have been received by China, and a small number of Tu-4s serve in the maritime reconnaissance rôle. The Mi-4 helicopter and the An-2 utility transport are manufactured under licence by the Chinese aircraft industry. The C.P.A.F.A.F. is divided into Divisions, the overall control of which rests with the Headquarters in Peiping, local control being exercised by local headquarters arranged geographically, and the principal formation is the Air Regiment of which there are normally three to each Division, although Divisional strength varies according to the military situation and logistics in a given area. The standard establishment of a C.P.A.F.A.F. Air Regiment is three squadrons. A chain of airfields is arranged in depth throughout the eastern areas of China, airfield concentrations being greatest in North China, Manchuria, the Shanghai area and the Foochow area. The air base complex in the last-mentioned area controls the Formosa Straits and includes the major fields of Chu-hsein and Hsiangtang from which C.P.A.F.A.F. fighters intercept intruding Nationalist aircraft flying from Formosa. During 1960, the Sino-Communists completed several air bases in Tibet. There is now a major C.P.A.F.A.F. headquarters at Nagchuka, 400 miles North of Lhasa, and new Tibetan bases include Kampa

An ex-U.S.A.F. F-104B Starfighter trainer of the C.N.A.F.



Twenty MiG-17s per month are being built in Communist China

One of ten T-28As of Cuba's " Fuerza Aérea Revolucionaria "

Dzong, 40 miles North of the Indian protectorate of Sikkim, and Tingri, 50 miles North of Mt. Everest.

Fighters: MiG-21, MiG-19, MiG-17, MiG-15. *Bombers:* Il-28. *Maritime Reconnaissance:* Tu-4. *Helicopters:* Mi-1, Mi-4. *Trainers:* MiG-15UTI, Il-28U, Yak-18, Yak-11. *Transports:* Il-14, Li-2, An-2. *Communications:* Yak-12, Po-2.

CHINA (NATIONALIST). The Chinese Nationalist Air Force based on the island of Formosa (Taiwan), approximately 100 miles from the Chinese mainland, has enjoyed considerable assistance from the U.S.A., and its equipment is entirely of U.S. origin. During 1960, the ageing F-84G Thunderjets were replaced by eighty F-100A Super Sabres modified to F-100D standards. These now supplement the two wings (each of seventy-five aircraft) of F-86F Sabres which are maintained at constant alert status. The C.N.A.F. also began to receive ex-U.S.A.F. F-104 Starfighters during 1960, and a wing of interceptors of this type is to be based at Kung Quan which possesses one of the longest runways in the world.

The Chinese Nationalists currently operate two wings of seventy-five F-86 Sabres. Yellow-and-black bands denote 3rd Wing

Kung Quan is one of about a dozen first-class bases employed by the C.N.A.F., these including Tainan, Taitung, Kangshan, Pingtung, Hengchun, Chaia, Huwei, Hsinchu, Ilan, and Taipei. There are two reconnaissance-fighter squadrons equipped with the RF-101C Voodoo and the RF-84F Thunderflash respectively; there is one squadron of RB-57 reconnaissance-bombers; the search and rescue units employ Grumman SA-16A and Convair PBY-5A amphibians, and Sikorsky S.55 helicopters, and there is a Transport Wing comprising one squadron of Fairchild C-119Gs and two squadrons of Curtiss C-46Ds and Douglas C-47s. A considerable proportion of the C.N.A.F. aircrews have been trained under the supervision of the Mutual Assistance Advisory Group by U.S. and Chinese instructors, and there are well-equipped primary, intermediate, advanced and operational training schools. A number of obsolete F-47D Thunderbolts, F-84G Thunderjets, and B-25C Mitchells are in " flyable storage ", and can be rapidly readied for combat in the event of an assault on Formosa by Sino-Communist forces, and the C.N.A.F. currently possesses some 400 combat aircraft in its active first-line strength, and 80,000 personnel.

Fighters: Lockheed F-104A Starfighter, North American F-86F Sabre. *Fighter-bombers:* North American F-100A(D) Super Sabre. *Reconnaissance Fighters:* McDonnell RF-101C Voodoo, Republic RF-84F Thunderflash. *Reconnaissance Bombers:* Martin RB-57. *Transports:* Fairchild C-119G, Curtiss C-46D, Douglas C-47. *Search and Rescue:* Grumman SA-16A Albatross, Convair PBY-5A. *Helicopters:* Sikorsky S.55, Sikorsky S.51, Bell 47. *Trainers:* North American F-100F Super Sabre, Lockheed F-104B Starfighter, Boeing-Stearman PT-17 Kaydet, Lockheed T-33A, North American T-6 Texan.

COLOMBIA. The *Fuerza Aérea Colombiana* (Colombian Air Force) is a small but well-equipped arm comprising a combat group equipped with CL-13B Sabre 6s and F-47D Thunderbolts; a transport group with three Douglas C-54Gs, four DHC-3 Otters, and a number of Douglas C-47s and Beech C-45s; a maritime-reconnaissance and rescue squadron equipped with PBY-5A amphibians; a flying school at the Marco Fidel Suarez base providing primary, basic and advanced flying training, and a helicopter school at the Gral Rojas Pinilla base.

Fighters: Canadair CL-13B Sabre 6, Republic F-47D Thunderbolt. *Transports:* Douglas C-54G, Douglas C-47, Beech C-45, de Havilland DHC-3 Otter. *Maritime Reconnaissance:* Convair PBY-5A. *Helicopters:* Bell 47G. *Trainers:* Canadair T-33A-N Silver Star, Beech 45 Mentor, North American T-6 Texan. *Communications:* de Havilland DHC-2 Beaver.

A Piper Tri-Pacer liaison aircraft of Cuba's F.A.R.

CONGO. The *Force Aérienne de la Congo*, or Congolese Air Force, was to have taken over the equipment and bases of the Belgian *Aviation de la Force Publique* which, prior to the establishment of the Congolese Republic in July 1960, was concerned entirely with the civilian duties of transport and communications, with headquarters at Ndolo, Leopoldville. The *Force Publique* operated eight Doves, a Heron and a Douglas C-47, but the Congolese Republic has few trained personnel, and owing to the unrest in the Republic since the acquisition of independence, the situation in the *Force Aérienne de la Congo* is uncertain. One Ilyushin Il-14 was presented as a gift to Premier Patrice Lumumba by the Soviet Union, and other Il-14s bearing Congolese insignia have been operated by Soviet crews.

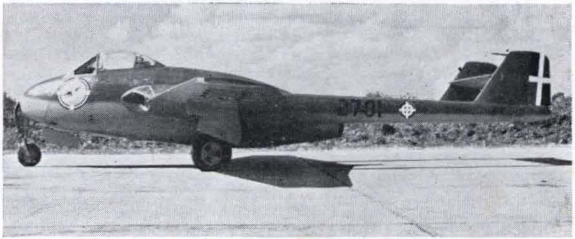
CUBA. The Cuban Air Force, known as the " Fuerza Aérea Revolucionaria " since the Cuban Revolution, has undergone major reorganisation in the past two years with the aid of Communist *bloc* countries. Russian airfield construction engineers are reportedly engaged in the construction of a major air base capable of accommodating modern jet combat aircraft, and twelve MiG-15UTI two-seat jet trainers were presented to the F.A.R. as a gift in 1960. It is reported that between 50 and 100 former-Czech Air Force MiG-17 fighters have been purchased for the F.A.R., and Mi-4 helicopters are

Hunter F.51s of No. 724 Squadron of the Danish Flyvevåbnet

being supplied by the Soviet Union. Cuban jet fighter pilots are being trained at the San Julian Air Base in the Pinar del Rio province by six Chinese and a number of Czech pilots seconded to the F.A.R. Prior to the Revolution, the Cuban Air Force, then known as the *Fuerza Aérea Ejercito de Cuba,* possessed seven T-33A trainers, eighteen B-26 Invader and a number of B-25J Mitchell bombers, fifteen Hawker Sea Furies 11s and two Sea Fury T.20s (although the Sea Furies were not assembled until after the downfall of the Batista régime) and small numbers of F.51D Mustang and F-47D Thunderbolt fighter-bombers, and small numbers of miscellaneous trainers, transports and communications types. After the Revolution, the F.A.R. obtained ten T-28A trainers from the U.S.A., several Piper Tri-Pacer light aircraft, and four Bell 47J and one Bell 47G-2 to supplement the Model 47J and two Model 47G-2 helicopters purchased during the Batista régime. An order for fifteen Hawker Hunter fighters was rejected. The F.A.R. currently comprises three fighter-bomber squadrons, two light bomber squadrons, a maritime reconnaissance squadron, and a transport squadron, in addition to a flying training school and communications and liaison flights. Most units are believed to be under strength.

F-47D Thunderbolts of Dominican Republic's Cuerpo de Aviacion

Fighter-bombers: Hawker Sea Fury F.B.11, Republic F-47D Thunderbolt, North American F-51D Mustang. *Bombers:* Douglas B-26 Invader, North American B-25J Mitchell. *Transports:* Douglas C-47, Curtiss C-46 Commando, Beech C-45. *Helicopters:* Bell Models 47G-2 and 47J, Westland Whirlwind, Mil Mi-4. *Trainers:* MiG-15UTI, North American T-28A, Lockheed T-33A, North American T-6 Texan, Boeing-Stearman PT-13 and PT-17 Kaydet., Hawker Sea Fury T.20. *Maritime Reconnaissance:* Convair PBY-5A, Grumman G-21 Goose. *Communications and Liaison:* De Havilland DHC-2 Beaver, Piper Tri-Pacer.



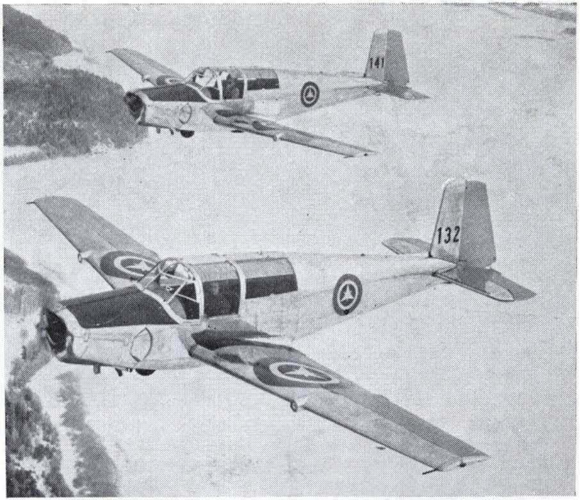
An ex-Swedish Vampire F.1 of El Cuerpo de Aviacion Militar

CZECHOSLOVAKIA. The Czechoslovak Air Force is a tactical force with strong defensive capabilities. With Headquarters in Prague, there are some five Fighter Regiments equipped with both day and all-weather versions of the MiG-17 and the supersonic MiG-19, four Ground Attack Regiments with MiG-15s and MiG-17s, and two or three Bomber Regiments with Il-28s. Each Regiment normally comprises three squadrons of twelve aircraft. Although the majority of the aircraft serving with the Czechoslovak Air Force are of Russian design, they have been, with the exception of the Il-28, built by the Czechoslovak aircraft industry. Current personnel strength is believed to be 25,000-27,000 officers and men, and total aircraft strength is of the order of 1,250 machines.

Fighters: MiG-17, MiG-19. *Ground Attack:* MiG-15. *Bombers:* Il-28. *Transports:* Il-14M (Avia-14), Il-12, Li-2, C.3 (Si 204D). *Helicopters:* Mi-1, Mi-4. *Trainers:* MiG-15UTI (S.102B), Yak-11 (C.11), Yak-11U (C.11U), Il-28U, Zlin 226B, Zlin 316T. *Communications:* Avia L-60, C.2B (Ar 96B).

DENMARK. The Royal Danish Air Force, generally known as the *Flyvevåbnet,* celebrated the tenth anniversary of its existence on October 1, 1960, at which time it possessed 286 aircraft of which 201 were turbojet-powered, and a personnel strength of slightly more than 10,000 of which 3,000 were civilians. The minimum first-line operational strength of the *Flyvevåbnet* is to be, according to the Defence Act, seven first-line operational squadrons, or *Eskadrillerne,* but at the present time there are eight first-line squadrons over which the *Flyvertaktisk Kommando* (Air Tactical Command) at Karup exercises operational control. These are No. 729 Squadron with RF-84F Thunderflash reconnaissance fighters, Nos. 723, 726, and 728 with F-86D Sabre all-weather fighters, No. 724 equipped with Hunter F.51 day interceptors, and Nos. 725, 727 and 730 with F-100D Super Sabres. The *Flyvevåbnet* has one transport and one rescue squadron, No. 721 equipped with the Catalina and the Sikorsky H-19. No. 47J Squadron supplies the crews for the two Agusta-Bell 722 helicopters which are operated on behalf of the Greenland Geological Survey, and early in 1961 the Danish government announced its intention of selling the Pembrokes. The *Traeningskommandoet* at Værløse is responsible for all training within the *Flyvevåbnet,* and the *Flyvematerieltjenesten* (Air Material Service) has maintenance units at Værløse and Aalborg, these being staffed primarily by civilians.

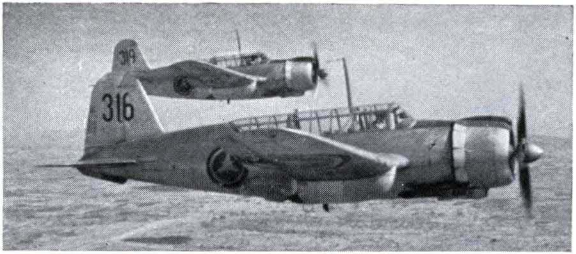
Fighters: North American F-86D Sabre, Hawker Hunter F.51. *Fighter-bombers:* North American F-100D Super Sabre. *Reconnaissance Fighters:* Republic RF-84F Thunderflash. *Transports:* Douglas C-54D, Douglas C-47A. *Helicopters:* Sikorsky H-19. *Trainers:* Hawker Hunter T.53, North American F-100F Super Sabre, de Havilland Chipmunk T.20, Gloster Meteor T.7, Lockheed T-33A, Convair PBY-5A. *A.O.P. and Liaison:* Piper L-21 Super Cub, S.A.I. ZK-VII. *Miscellaneous:* Gloster Meteor T.T.20, Gloster Meteor F.8, Republic F-84G Thunderjet.



SAAB-91C Safir trainers of the Imperial Ethiopian Air Force

DOMINICAN REPUBLIC. The Dominican Military Aviation Corps, or *El Cuerpo de Aviacion Militar,* has a personnel strength of some 3,500–4,000 officers and men, and, for its size, a surprising number of different aircraft types obtained from a variety of sources. There are two first-line fighter-bomber squadrons each possessing some thirty aircraft and reserves. These are equipped with the F-51D Mustang, the F-47D Thunderbolt, and Vampire F.1s, the last-mentioned type having been purchased from Sweden, together with the Mustangs, in 1952. Attempts on the part of the Dominican government to purchase F-86F Sabres from Japan and CL-13B Sabre Mk. 6s from Canada were frustrated, but it is reported that a number of G.A.M. Dassault Mystère IV fighters have been acquired. There is also a first-line bomber squadron equipped with B-17G Fortresses and B-26 Invaders, the latter being acquired illicitly, having originally been sold in the U.S.A. for aerial photographic work in Chile! The Aviation Corps is administered by the Secretary of State for War, Marine and Aviation.

Fighter-bombers: North American F-51D Mustang, Republic F-47D Thunderbolt, de Havilland Vampire F.1. *Fighters:*



Ethiopia acquired sixty-six SAAB-17A bombers from Sweden

G.A.M. Dassault Mystère IVA (?). *Bombers:* Douglas B-26 Invader, Boeing B-17G Fortress. *Transports:* Curtiss C-46, de Havilland DHC-2 Beaver. *Patrol and Rescue:* Convair PBY-5A. *Trainers:* Boeing-Stearman PT-17 Kaydet, North American T-6 Texan, Beech T-11 Kansan. *Liaison:* Cessna 170.

ECUADOR. The *Fuerza Aérea Ecuatoriana* (Ecuadorean Air Force) is a small arm comprising three operational squadrons. There is one squadron of F-47D Thunderbolt fighter-bombers, one squadron of reconnaissance fighters equipped with the Meteor F.R.9, twelve of which were acquired from the U.K. in 1954–5, together with six Canberra B.6s which equip the bomber squadron. There are small transport and training elements, and a flight of PBY-5A amphibians for coastal patrol, but most of the personnel of the *Fuerza Aérea* have received their training abroad. In 1960, three Bell H-13 helicopters were obtained under the Reimbursable Military Assistance Programme and late in the year the Ecuadorean government evinced interest in the purchase of twenty-four Hunter F.6 fighters from the U.K.

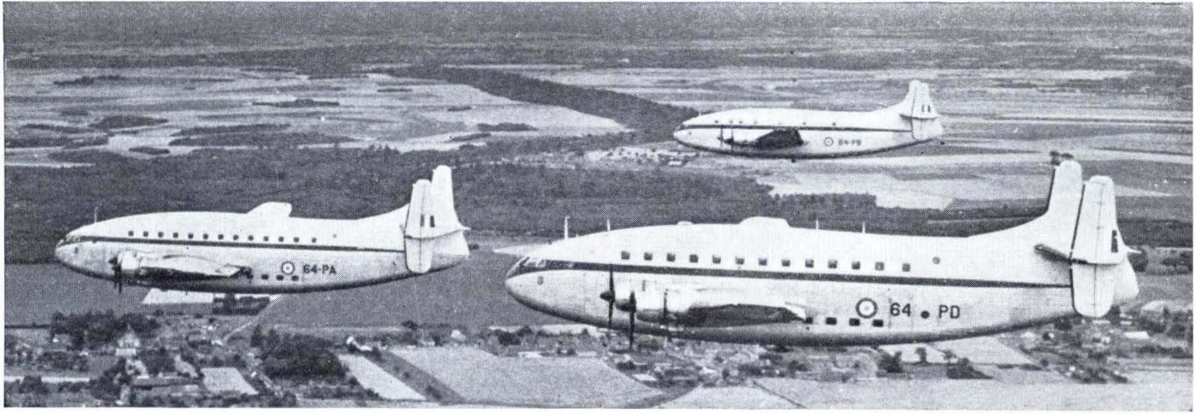
SAAB-91D trainers of Finland's Satakunnan Lennosto at Pori

Fighter-bombers: Republic F-47D Thunderbolt. *Reconnaissance Fighters:* Gloster Meteor F.R.9. *Bombers:* English Electric Canberra B.6. *Transports:* Douglas C-47, Beech C-45. *Patrol:* Convair PBY-5A. *Helicopters:* Bell H-13. *Trainers:* North American T-6 Texan, Fairchild M-62.

ETHIOPIA. The Imperial Ethiopian Air Force has a current personnel strength of some 4,500 officers and men, and its training is supervised by Swedish and U.S. instructors. Swedish personnel have acted in an advisory capacity since the post-war formation of the I.E.A.F., and much of the force's current equipment has been purchased from Sweden, including sixteen SAAB-91A, sixteen SAAB-91B and ten SAAB-91C Safir training and liaison aircraft, and sixty-six SAAB-17A attack bombers. Eight Firefly attack fighters were purchased from the United Kingdom in 1952, but the I.E.A.F. did not obtain any modern jet aircraft until 1959 and the arrival of a U.S.A.F. Training Mission at Bishoftu. The Mission was accompanied by a number of Lockheed T-33A jet trainers, and twelve F-86F Sabres were supplied in July 1960 to equip the first I.E.A.F. interceptor squadron. There are also two attack squadrons equipped with the SAAB-17A and based at Asmara, Eritrea, and Dire Dawa. The Central Flying School, the Central Workshop for engine and airframe overhaul, and the transport and communications units are housed at Bishoftu. The SAAB-91A Safirs were withdrawn from service in 1960. The I.E.A.F. is to purchase six PBY-5A amphibians from the Royal Norwegian Air Force to equip a rescue and reconnaissance unit.

Interceptor Fighters: North American F-86F Sabre. *Attack Bombers:* SAAB-17A. *Transports:* Douglas C-47, de Havilland Dove, Avro Anson Mk. 19. *Trainers:* Lockheed T-33A, SAAB-91B Safir, Fairey Firefly Mk. 1, Cessna AT-17 Bobcat. *Communications and Liaison:* SAAB-91C, Stinson L-5 Sentinel.

FINLAND. Finland's air arm, or *Ilmavoimien*, is currently concerned primarily with training, transport and communications duties, possessing extremely few operational aircraft. The Air Force Headquarters, or *Ilmavoimien Esikunta,* is situated



Sahara heavy transports of the Armée de l'Air's 64th Escadre of the Groupement des Moyens Militaires de Transport Aérien

at Helsinki Munkkiniemi, and the *Ilmavoimien* comprises the *Ilmasotakoulu* (Air War School) at Kauhava, the *Ilmavoimien Varikko* (Air Force Depot) at Tampere, the *Ilmavoimien Viestipataljoona* (Air Force Signal Battalion) at Hämeenlinna, and three Wings (*Lennosto*). The *Satakunnan Lennosto* at Pori is a flying training wing equipped with the SAAB-91D and the Magister, these aircraft entering service in 1960, and the initial order for twenty SAAB-91Ds being supplemented by an order for a further ten aircraft when the decision was taken to scrap the indigenous Valmet Vihuri II and III trainers owing to the number of accidents suffered by this type. The SAAB-91D is also employed by the *Ilmasotakoulu*, together with the Vampire T.55, nine of the latter having been acquired by the Finnish government. The other wings are the *Karjalan Lennosto* at Utti, and the *Hämeen Lennosto* at Jyväskylä. These operate several types, including the Vampire F.B.52 (six of which were originally acquired), and the Folland Gnat Mk. 1, ten of which were supplied as fighter-bombers and two as reconnaissance-fighters. The Magister jet trainer entered service in 1960, thirty-two machines of this type having been ordered, and other equipment acquired during the course of 1960 was an Ilyushin Il-28U, two SAAB-17A target-tugs, and two DC-3 transports, the last-mentioned aircraft having been purchased from Finnair for paratroop training, supply dropping, etc. Three Valmet Viima IIA trainers and one Focke-Wulf Fw 44 remain in service for communications duties, all other machines of these types having been disposed of during 1959-60. One Polish-built SM-1 helicopter is used for ambulance duties.

Fighters: Folland Gnat Mk. 1. *Fighter-bombers:* De Havilland Vampire F.B.52. *Transports:* Douglas DC-3, Hunting Pembroke C.53. *Communications and Liaison:* De Havilland DHC-2 Beaver, Fieseler Fi 156C Storch, Focke-Wulf Fw 44 Stieglitz, Valmet Viima IIA. *Helicopters:* SM-1. *Target-tugs:* SAAB-17A. *Trainers:* Potez Air-Fouga Magister, SAAB-91D Safir, de Havilland Vampire T.55. *Miscellaneous:* Ilyushin Il-28U.

FRANCE. French military aviation comprises the Air Force, or *Armée de l'Air,* the Naval Air Arm, or *Aéronautique Navale,* and Army Aviation, the *Aviation Légère de l'Armée de Terre.* The *Armée de l'Air,* reduced by the 1960 Budget to thirty-five squadrons with 660 aircraft as compared with a first-line strength of sixty squadrons planned for 1960 some years

An F-86K Sabre of the 13th Escadre of the Armée de l'Air

ago, is a force consisting primarily of fighter, fighter-bomber, close-support, transport and training units. There is, however, the nucleus of a Bombing Command, the *Commandement de l'Aviation de Bombardement*, which nominally controls the *Groupes de Bombardement* I/91 and II/91 (each equivalent to one *Escadron*) with Douglas B-26 Invaders and (92^{e} escadre) SO-4050 Vautour IIB light bombers, but which will presumably control the planned nuclear striking force for which fifty Mirage IVA bombers were authorised in the 1960 Budget.

The backbone of the *Armée de l'Air* is provided by the *Escadres de Chasse*, each of which has an establishment of two *Escadrons* (twenty-five aircraft). These are divided between the defence organisation, the *Défense Aérienne*, and the Tactical Air Command, the *Commandement Aérienne Tactique*, or C.A.Tac. The *Défense Aérienne* co-ordinates the interceptor forces and anti-aircraft regiments in national and North African territory, and controls the 5th *Escadre* (Mystère IVA), the 6th (Mistral 535), the 7th (Mistral 535), the 8th (Mystère IVA), the 10th (Super Mystère B2), the 12th (Super Mystère B2), and the 30th (Vautour IIN). The C.A.Tac. controls the all-weather interceptors, reconnaissance and fighter-bomber formations based in Eastern France and Germany under the 4th A.T.A.F. of N.A.T.O., and its forces comprise the 1st *Escadre* (F-84F Thunderstreak), the 2nd (Mystère IVA), the 3rd (F-100D Super Sabre), the 4th (F-84F Thunderstreak), the 9th (F-84F Thunderstreak), the 11th (F-100D Super Sabre), the 13th (F-86K Sabre), and the 33rd (RF-84F Thunderflash).

In addition to the *Escadres* controlled by the *Défense Aérienne* and C.A.Tac., there is a support unit, the 20th *Escadre* equipped with the AD-4 Skyraider and based in Algeria. The *Groupement des Moyens Militaires de Transport Aérien*, or Transport Command, maintains a network of regular transport services within the French Communauté, and comprises the 61st, 62nd and 63rd *Escadres* equipped with the Noratlas, and the 64th *Escadre* with the Noratlas, the Br.761S and the Br.765 Sahara. In addition, there is the 60th *Escadre de Transport et de Liaisons* equipped with such types as the M.S.760 Paris, the Beech UC-45, the SO-30P, the M.D.312 and the C-47, and the *Groupes Sahariens de Reconnaissance et d'Appui* equipped with C-47s and MH-1521M Broussards. The *Escadres d'Hélicoptères* have some 250 helicopters of the Sikorsky H-19, H-34 and Alouette II types, and the *Escadrilles d'Aviation Légère d'Appui* fly the T-6 Texan and the T-28 Fennec in Algeria under the *Commandement de l'Aviation Légère de l'Armée de l'Air*. The *Escadrilles de Liaisons Aériennes* and the *Escadrilles d'Outre-Mer* are equipped with a variety of aircraft types.

The Mirage IIIC interceptor is currently entering service with the *Armée de l'Air*, one hundred examples of this type having been ordered. The delivery of a further three hundred Mirage III variants to the *Armée de l'Air* is anticipated by the end of 1964, and credits have already been made available for the second batch of 100 which will comprise twenty-six Mirage IIIB two-seat trainers, fifty tactical reconnaissance models and twenty-four Mirage IIID or IIIE ground attack aircraft. It is anticipated that all first-line interceptor, fighter-bomber, strike fighter and reconnaissance units will be equipped with the Mirage. The 1960 Budget also provided for the purchase of eighty-three Douglas AD-4 Skyraiders and 135 North American T-28As for use in the Algerian war to which a considerable proportion of the *Armée de l'Air* is committed. The latter are extensively modified in France to undertake the close-support rôle. The current personnel strength of the *Armée de l'Air* is approximately 108,000 officers and men.

Interceptor Fighters: North American F-86K Sabre, Sud-Aviation Vautour IIN, G.A.M. Dassault Mystère IVA, G.A.M.

Super Mystère B2s of the 12th Escadre of the Défense Aérienne

Dassault Super Mystère B2, G.A.M. Dassault Mirage IIIC. *Fighter-bombers:* Republic F-84F Thunderstreak, North American F-100D Super Sabre, Sud-Est Mistral 535. *Reconnaissance Fighters:* Republic RF-84F Thunderflash. *Light Bombers:* Sud-Aviation Vautour IIB, Douglas B-26 Invader. *Close-support:* North American T-28 Fennec, Douglas AD-4 Skyraider. *Helicopters:* Sikorsky H-19, Sikorsky H-34A, Bell 47, Sud-Aviation Alouette II. *Transports:* Breguet 761S, Breguet 765 Sahara, Dassault MD-312 Flamant, Nord 2501 Noratlas, Douglas C-47, Douglas C-54, Centre NC-701 and 702 (Si 204), Beech UC-45. *Liaison and Communications:* Morane-Saulnier M.S.760 Paris, Holste MH-1521M Broussard, Nord 1101, Nord 1002 Pingouin II. *Search:* Lockheed 749 Constellation. *Trainers:* Potez Air-Fouga Magister, Dassault MD-311 and 315 Flamant, Morane-Saulnier M.S.733 Alcyon, North American T-6 Texan, S.I.P.A. S.121, Lockheed T-33A, de Havilland Vampire F.B.5.

The French naval air arm, or *Aéronautique Navale* (usually abbreviated to *Aéronavale*) will, by the mid 'sixties, comprise a modest but efficient and modern carrier-borne strike and anti-submarine force built around two new carriers, the *Clémenceau* and the *Foch*, each of which will carry sixty Etendard IVM strike fighters and Alizé anti-submarine aircraft. Seventy-five Alizés have been delivered to the *Aéronavale*, and the delivery of an initial batch of fifty Etendard IVMs will begin in November 1961. A second batch of fifty Etendards will follow.

At the present time, the French Navy possesses, in addition to the new *Clémenceau*, three elderly carriers, *La Fayette*, the *Arromanches* and the *Dixmude*, the last-named having been relegated to transport duties. There are three Alizé-equipped shipboard anti-submarine squadrons (4F, 6F and 9F), two all-weather shipboard fighter squadrons equipped with the Aquilon (11F and 16F), and four close-support and attack squadrons (12F, 14F, 15F and 17F) which, currently equipped with the F4U-7 Corsair, are to be re-equipped during 1962 with the Etendard IVM. There are three assault squadrons equipped with Sikorsky HSS-1 helicopters (31F, 32F and 33F), seven shore-based maritime reconnaissance squadrons, 21F and 22F with the P2V-6 Neptune, 23F, 24F, 25F and 28F with the P2V-7 Neptune, and 27F with the P5M-2 Marlin, and the two coastal patrol squadrons, 8S and 9S, with Goose amphibians and Lancasters respectively. It is anticipated that the maritime reconnaissance squadrons will re-equip with the Breguet 1150 Atlantic by the mid 'sixties, and financial appropriations for twenty-seven of these were voted in 1961.

Twenty-seven F-104F Starfighters are in service at Norvenich

Gannet A.S.4s of the No. 1 Marinefliegerhorstgruppe

Fighters: Sud-Est Aquilon 20, 202 and 203. *Fighter-bombers:* Chance Vought F4U-7 Corsair. *Anti-submarine:* Breguet 1050 Alizé. *Maritime Reconnaissance:* Lockheed P2V-6 and P2V-7 Neptune, Martin P5M-2 Marlin. *Helicopters:* Sikorsky HRS-1, Sikorsky HSS-1, Vertol HUP-2, Bell 47G, Sud-Aviation Alouette II. *Transports:* Douglas C-47, Dassault MD-312, Centre NC-701 and -702, Lockheed PV-2 Harpoon, Sud-Ouest SO-94. *Trainers:* Morane-Saulnier MS-733, North American SNJ-5, Potez Air-Fouga CM-175 Zéphyr, de Havilland Vampire F.B.5, Beech SNB-5, Sud-Ouest SO-95, Avro Lancaster, Sud-Est SE-161 Languedoc, Short Sunderland M.R.5. *Communications and Liaison:* Holste MH-1521M Broussard, Nord 1002 Pingouin II, Convair PBY-5A.

French Army Aviation, or *Aviation Légère de l'Armée de Terre* (A.L.A.T.), is equipped with light aircraft and helicopters for observation, reconnaissance, close-support and supply duties, and has its own training schools.

Light Aircraft: Nord 3400, Cessna L-19 Bird Dog, Piper L-18 and L-21 Super Cub, Holste MH-1521M Broussard, Nord NC-856A Norvigie. *Helicopters:* Sud-Aviation SO-1221 Djinn, Sud-Aviation SE-3130 Alouette II, Bell 47G, Sikorsky H-19, Vertol H-21. *Trainers:* Nord 3202.

GERMANY (FEDERAL REPUBLIC). The Federal German Air Force, or *Deutsche Luftwaffe*, will, by 1964, be the strongest single air arm in West Europe with a total of approximately 1,000 modern first-line jet aircraft and 100,000 personnel. It will thus become the world's fourth largest air arm. Control of the *Luftwaffe* is exercised by the *Führungsstab Luftwaffe* (Operations Staff) in Bonn, and the force is divided into the *Luftwaffen Gruppe Nord* with headquarters in Münster; the *Luftwaffen Gruppe Sud* with headquarters at Karlsruhe; the 1st Air Defence Division with headquarters at Munich; the 3rd Air Defence Division with headquarters at Münster, and the *Kommando der Schulen*, the flying training command. At the present time, there are five fighter-bomber wings (Nrs. 31, 32, 33, 34, and 35) each equipped with two squadrons of twenty-five Thunderstreaks; two reconnaissance-fighter wings (Nrs. 51 and 52) each comprising two squadrons of sixteen Thunderflashes; three interceptor fighter wings (Nrs. 71, 72, and 73) each having two squadrons of eighteen Sabre Mk. 6s, and two transport wings (Nrs. 61 and 62), the former having three squadrons of eighteen Noratlas transports and the latter having two squadrons of eighteen Noratlas transports. The training organisation includes the *Flugzeugführerschule* (Pilot School) " A " at Landsberg with Piper L-18C Super Cubs and Harvard Mk. 4s; *Flugzeugführerschule* " B " at Fürstenfeldbruck with Magisters and T-33As; *Flugzeugführerschule* " S " at Wunstorf with groups at Fassberg and Diepholz and equipped with the Piaggio P.149D and the Pembroke Mk. 54; the *Waffenschule* (Air Weapons School) 10 for fighter pilots at Oldenburg with Sabre Mk. 5s, Thunderstreaks, and F-86K Sabres, and *Waffenschule* 50 at Erding for reconnaissance pilots with Thunderflashes.

Since the *Luftwaffe* was re-formed in 1956, it has received seventy-five Sabre Mk. 5s, 225 Sabre Mk. 6s, eighty-eight F-86K Sabres, 450 F-84F Thunderstreaks, 108 RF-84F Thunderflashes, thirty-three Pembroke Mk. 54s, 262 Piaggio P.149Ds, 137 Noratlases, two Heron Mk. 2s, ten C-47s, forty-seven Super Cubs, sixty Harvard Mk. 4s, and a small number of Bell 47G helicopters. In addition, 254 Magister trainers are in process of delivery, thirty F-104F trainers were delivered late in 1960, and deliveries have commenced of ninety-six F-104G Super Starfighters from the U.S.A. and fifty Fiat G.91Rs from Italy. These are to be followed by twenty Fiat G.91T trainers, 604 European-built F-104Gs, and 232 German-built G.91s. Five Sikorsky H-34 helicopters were received late in 1960. By 1965, the *Luftwaffe* will possess only two combat types, the F-104G Super Starfighter and the G.91. It will then have twenty-eight wings, including two transport and two helicopter wings.

Fighters: Canadair CL-13B Sabre Mk. 6, Lockheed F-104G Super Starfighter. *Fighter-bombers:* Republic F-84F Thunderstreak, Fiat G.91. *Reconnaissance Fighters:* Republic RF-84F Thunderflash, Fiat G.91R. *Transports:* Convair C-131D, Nord 2501D Noratlas, Douglas C-47, de Havilland Heron 2, Hunting Pembroke Mk. 54. *Helicopters:* Sikorsky H-34, Bell 47G. *Trainers:* Fiat G.91T, Lockheed F-104F, North American F-86K Sabre, Potez Air-Fouga C.M.170R Magister, Piaggio P.149D, C.C.F. Harvard Mk. 4, Canadair CL-13A Sabre Mk. 5, Hunting Pembroke Mk. 54, Piper L-18 Super Cub.

The *Deutsche Kriegsmarine*, or Federal German Navy, has a small shore-based air arm known as the *Marine-Fliegertruppe*. The first operational element, No. 1 *Marinefliegerhorstgruppe*, was formed with the acquisition of fifteen Gannet A.S.4 anti-submarine aircraft and one Gannet T.5 trainer, and these were followed by thirty-four Sea Hawk Mk. 100 fighter-bombers and thirty-four Sea Hawk Mk. 101 reconnaissance-fighters which are eventually to be replaced by F-104G Super Starfighters. Five UF-1 Albatross amphibians were obtained for air/sea rescue duties, and the remaining equipment of the *Marine-Fliegertruppe* comprises twelve Do 27s, five Pembrokes, four Skeeter and four Sycamore helicopters and a few Magisters.

Fighter-bombers: Hawker Sea Hawk Mk. 100. *Fighter-reconnaissance:* Hawker Sea Hawk Mk. 101. *Anti-submarine:* Fairey Gannet A.S.4. *Helicopters:* Saro Skeeter Mk. 51, Bristol Sycamore Mk. 52. *Transports:* Hunting Pembroke C.(P.R.) 1. *Communications and liaison:* Do 27A. *Trainers:* Fairey Gannet T.5, Potez Air-Fouga C.M.170R Magister. *Rescue:* Grumman UF-2 Albatross.

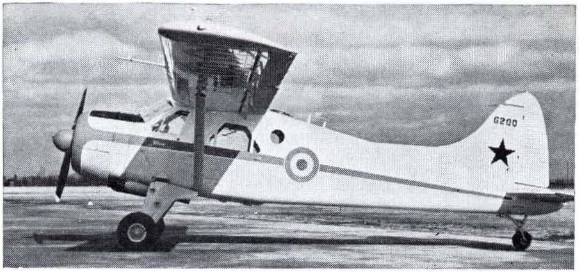
The *Deutsche Heeres-Luftfahrzeuge* (German Army Aircraft) now form a very substantial force of light utility aircraft and light, medium and heavy helicopters for air observation post, liaison, ambulance, and transport support of the *Wehrmacht*. Apart from initial grading, Army pilots do their entire training on the Do 27B at Memmingen and Mengen, helicopter pilots training on the Bell 47G and the Hiller UH-12C. The Army has received the bulk of the 428 Do 27s ordered, and most of the eighty-three Sycamores purchased by Germany. Other helicopters received include forty-seven Sikorsky H-34s, twenty-six Vertol H-21Cs and six SO-1221 Djinns, and the Army is in process of receiving 205 Alouette IIs.

Helicopters: Sud-Aviation SE-3130 Alouette II, Sikorsky H-34, Sud-Aviation SO-1221 Djinn, Bell 47G, Hiller UH-12C, Bristol 171 Sycamore Mk. 14, Vertol H-21C. *A.O.P.:* Dornier Do 27A. *Trainers:* Do 27B.

GERMANY (DEMOCRATIC REPUBLIC). The air arm of the German Democratic Republic, known as the *Luftstreitkrafte*, is a relatively small defensive force, its sole operational element comprising three interceptor wings which, equipped with MiG-15s and MiG-17s until late 1960, are currently converting to the supersonic MiG-21. There are 70–100 fighters, and some 70% of the 11,000 personnel are attached to the interceptor units. Since the formation of the *Luftstreitkrafte* late in 1956, financial difficulties and personnel shortages have frustrated attempts to bring about any major expansion of the force. Most flying training is now undertaken in the Republic, and there are small transport, liaison and communications units.

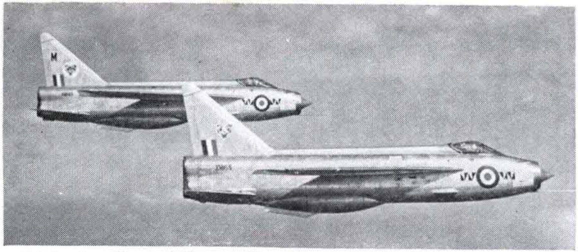
Fighters: MiG-15, MiG-17, MiG-21. *Helicopters:* Mi-4. *Transports:* VEB Il-14P, An-2. *Trainers:* MiG-15UTI, Yak-11, Yak-18. *Liaison:* Yak-12, Po-2.

GHANA. The Ghanaian Air Force was established in 1959, and an Air Force Training School was founded at Accra and staffed by instructors seconded to the Ghanaian government from the Israeli Defence Force/Air Force and the Indian Air Force. The first Chief of Staff of the Ghanaian Air Force was an Indian officer, Air Commodore K. J. Singh, and the new air arm's first aircraft was a Piper Super Cub presented to Ghana by the Israeli government. The initial equipment of the Training School comprised twelve Hindustan HT-2 primary trainers, but late in 1960, these were augmented by four ex-R.A.F. Chipmunk T.10s, a further eight aircraft of this type being received early in 1961. The first ten Ghanaian Air Force pilots received their wings in November 1960. Also in 1960, the Ghanaian government placed an order in Canada for fourteen DHC-2 Beavers and another order in the Soviet Union for fourteen Ilyushin Il-18s, ten of which are to be operated by the Air Force, and early in 1961 three An-12s were presented by the Soviet Union. Two of the Beavers are fitted with dual controls for training purposes, these being delivered in December 1960, six are equipped for camera installations and will be flown by the Ghanaian Air Force on survey operations, and the remainder will be used for emergency ambulance duties and communications between the major towns and remotely located administrative areas. Ghanaian personnel are being trained in the Soviet Union to operate the Il-18 transports which will equip the Ghanaian Air Force's first transport squadron. At the end of January 1961, twelve DHC-3 Otter and eight DHC-4 Caribou transports were ordered from Canada, and six Westland Whirlwind Srs.3 helicopters were scheduled to be delivered during the Autumn of 1961. Ghana has also received an Mi-4 helicopter as a gift from the Soviet Union. It is planned to form two jet fighter-bomber squadrons. Each squadron is expected to consist of sixteen aircraft, and the Ghanaian Air Force is reportedly interested in the acquisition of surplus R.N. Sea Hawks. The first Ghanaian Air Force base at Takeradi came into operation in March 1961, and a second base to take jet aircraft is being built at Tamale in northern Ghana. R.A.F. personnel have been seconded to Ghana to reorganise training within the Air Force.



One of fourteen DHC-2 Beavers of the Ghanaian Air Force

Transports: Ilyushin Il-18, Antonov An-12. *Communications:* De Havilland DHC-2 Beaver. *Liaison:* Piper Super Cub. *Trainers:* De Havilland Chipmunk T.10, Hindustan HT-2, de Havilland DHC-2 Beaver. *Helicopters:* Mil Mi-4, Westland Whirlwind Srs.3.



Lightning F.1s of No. 74 Squadron, R.A.F. Fighter Command

GREAT BRITAIN. Although the Royal Air Force has been steadily reduced in size in recent years, it is still a formidable force with extensive overseas commitments under the N.A.T.O., S.E.A.T.O., A.N.Z.A.M., and Baghdad pacts, and during 1961 its striking power and defensive capabilities are being increased by the progressive re-equipment of Bomber and Fighter Command squadrons with improved versions of the Vulcan and Victor bombers and the Lightning interceptor. The current personnel strength of approximately 158,700 officers and men is being steadily reduced until it reaches 135,000 by 1962. The principal Commands of the R.A.F., administrative control of which is vested in the Air Council, are Fighter, Bomber, Coastal, Transport and Flying Training Commands.

The responsibility for the aerial protection of the United Kingdom is vested in R.A.F. Fighter Command which comprises two Groups, No. 11 with Headquarters at Leconfield and No. 12 Group with Headquarters at Horsham St. Faith, and its strength has been estimated at about thirty squadrons, distributed fairly equally between Hunter F.6 day interceptors, Javelin all-weather interceptors and Bloodhound surface-to-air missiles. The Hunters are being progressively replaced by the Lightning, the first squadrons to re-equip with this type being Nos. 56, 74 and 111. Under a unified air defence system for Europe which came into being in 1961, R.A.F. Fighter Command has been transferred to the control of SACEUR (Supreme Allied Commander Europe), although the British government can still deploy the Command's aircraft as it thinks fit and there has been no change in the Command's operational rôle. Fighter Command also includes the Central Fighter Establishment, and operational conversion units, the latter having Hunter F.4s, Javelin F.A.W.5s and Canberra T.11s.

R.A.F. Bomber Command currently possesses two Groups, Nos. 1 and 3, and comprises light bomber units with the Canberra B.2 and B.6, medium bomber units with the Valiant B.1, the Victor B.1 and the Vulcan B.1, although the Vulcan B.2 and Victor B.2 are now being introduced, and reconnaissance units with the Valiant B.(P.R.)K.1 and Canberra P.R.7 and P.R.9. There are several Operational Conversion Units of which No. 230 O.C.U. has Vulcan B.1s, No. 231 O.C.U. operates Canberra B.2s and P.R.3s, and No. 232 O.C.U. has Valiant B.1s and Victor B.1s. R.A.F. Bomber Command also includes the Central Reconnaissance Establishment at Wyton which has Canberra P.R.7s and P.R.9s, Valiant B.(P.R.)K.1s and Victor B.1s, and the Bomber Command Bombing School which is equipped with such aircraft as the Lincoln B.2, the Varsity T.1 and the Hastings T.5.

R.A.F. Coastal Command consists of two Groups, Nos. 18 and 19, and includes R.A.F. Gibraltar. There are eight-ten squadrons equipped with the Shackleton M.R.2c and M.R.3; helicopter squadrons include No. 118 with Sycamore H.R.14s, and Nos. 22 and 228 with Whirlwind H.A.R.2s, and there is also a Meteorological Squadron (No. 202) equipped with the Hastings Met.1.

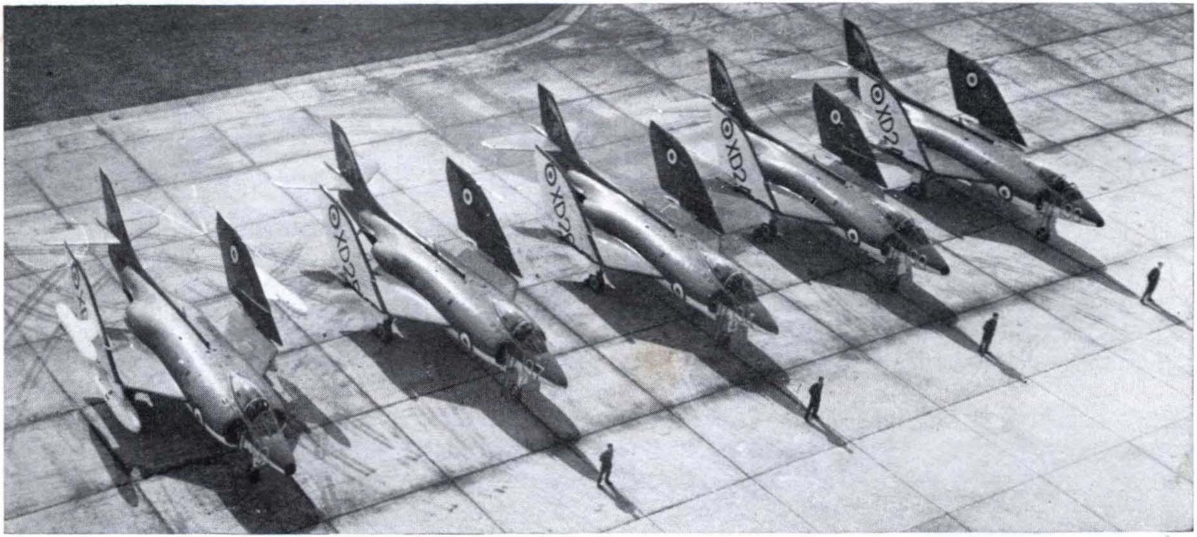
R.A.F. Transport Command is in process of receiving fifty-six Argosy C.1 medium tactical transports, five of which are being delivered in 1961, five Comet 4Cs, and will begin to receive ten Short S.C. 5/10 Belfast heavy strategic freighters in 1963. Current Transport Command strength includes Nos. 47 and 53 Squadrons with the Beverley C.1, Nos. 24, 36 and 114 Squadrons with the Hastings, Nos. 99 and 511 Squadrons with the Britannia, and No. 216 Squadron with the Comet. Pioneers and Twin Pioneers equip No. 230 Squadron, and No. 225 Squadron is equipped with Sycamore and Whirlwind helicopters. The current medium-range fleet comprises forty-eight Hastings, thirty-two Beverleys and twelve Valettas. There is also an Operational Conversion Unit and the Queen's Flight, the latter equipped with the Heron C.3 and the Whirlwind H.C.C.8, and in October 1960, a Trials Unit was formed for the Belvedere helicopter which is now being introduced into service.

R.A.F. Flying Training Command which, during the course of 1961, is receiving fourteen pre-production and thirty production Gnat trainers, this type supplementing and eventually supplanting the Vampire T.11, comprises two Groups, Nos. 23 and 25, and also administers the University Air Squadrons and the Air Training Corps. It includes the Central Navigation and Control School, the R.A.F. Flying College, the R.A.F. College, the Central Flying School, the Air Electronic School, and the Flying Training and Air Navigation Schools. The Central Flying School operates such types as the Provost and Jet Provost, the Valetta C.1, the Varsity T.1, the Vampire T.11, the Hunter F.4 and the Canberra T.4. The R.A.F. Flying College operates the Valetta C.1, the Lincoln B.2, and the Canberra B.2 and P.R.7; the R.A.F. College operates the Jet Provost T.3, the Valetta T.3, the Varsity T.1 and the Vampire T.11; the Central Navigation and Control School employs the Varsity T.1 and Vampire T.11; Nos. 1 and 2 Air Navigation Schools are equipped with the Varsity T.1 and Valetta T.3, the latter also using the Meteor N.F.(T.) 14, Provost T.1 is used by Nos. 1, 6 and 8 Flying Training and the Jet Provost T.3 is operated by No. 2 F.T.S., and Schools, the Vampire T.11 serves with Nos. 1, 4, 5, 7, and 8 F.T.S.s.

R.A.F. Maintenance Command, which consists of Nos. 40 and 41 Groups, has no flying units, apart from communications flights, and R.A.F. Technical Training Command, which consists of Groups 22, 24 and 27, also possesses only communications flights. R.A.F. Signals Command consists of the Central Signals Establishment with Varsity T.1s and Lincoln B.2s, No. 51 Squadron with Canberra B.2s and B.6s, No. 115 Squadron with Varsity T.1s, and No. 245 Squadron with Canberra B.2s. The Command also operates one or two Comet 2Rs.

The R.A.F.'s principal contribution to N.A.T.O. forces in Europe is the 2nd Tactical Air Force which includes some half-dozen interceptor fighter squadrons with Hunter F.6s and Javelins; two fighter-reconnaissance squadrons equipped with the Hunter F.R.10, and several reconnaissance squadrons with Canberra P.R.7s and light tactical bomber squadrons with Canberra B.(I).6s and B.(I).8s. Other Overseas Commands include the Air Headquarters Malta which administers the units on the island, including the Shackleton M.R.2s of No. 38 Squadron and the Canberra P.R.3s of No. 39 Squadron; the Near East Air Force (Cyprus) which includes a Canberra Wing, a Hastings squadron (No. 70), and a Sycamore helicopter squadron (No. 103), and the Far East Air Force which comprises No. 224 Group and Air Headquarters Hong Kong. Units attached to the F.E.A.F. include No. 205 Squadron with Shackletons, No. 209 Squadron with Pioneers, No. 52 Squadron with Valettas No. 110 Squadron with Sycamores, No. 48

Javelin F.A.W.9 night and all-weather fighters of No. 25 Squadron. Javelins equip about one-third of Fighter Command units



Scimitars of the Fleet Air Arm's No. 807 Squadron which, seen here at Lossiemouth, are normally embarked aboard " Ark Royal "

Squadron with Hastings, and several squadrons with Venoms, Canberras, and Meteor P.R.10s and N.F.14s. The F.E.A.F. fighter squadrons are to be re-equipped with Hunters and Javelins, and it has been stated that surface-to-air missiles, probably either Bloodhounds or Thunderbirds, are to be sent to Singapore to help strengthen the island's defences. The other R.A.F. Overseas Command covers the units in Aden, East Africa, and the Persian Gulf under Air Forces Middle East (Aden). These forces include squadrons equipped with the Hunter F.G.A.9, a Shackleton M.R.2c maritime reconnaissance squadron, three Twin Pioneer squadrons, two Beverley squadrons and a Valetta squadron.

Fighters: English Electric Lightning F.1, Hawker Hunter F.6, Gloster Javelin F.A.W.4, 5, 6, 7, 8 and 9, Gloster Meteor N.F.14. *Bombers:* Avro Vulcan B.1 and B.2, Handley Page Victor B.1 and B.2, Vickers Valiant B.1, English Electric Canberra B.2, B.6, B.(I)6 and B.(I)8. *Reconnaissance:* Vickers Valiant B.(P.R.).K.1, Hawker Hunter F.R.10, Vickers-Supermarine Swift F.R.5, English Electric Canberra P.R.3, 7, and 9, Gloster Meteor P.R.10. *Transports:* Armstrong Whitworth Argosy C.1, Blackburn Beverley C.1, Bristol Britannia C.1, de Havilland Comet C.2, Handley Page Hastings C.1A, C.2 and C.4, Vickers Valetta C.1, Scottish Aviation Pioneer C.C.1, Scottish Aviation Twin Pioneer C.C.1, de Havilland Heron C.3, de Havilland Devon C.1. *Ground Attack:* Hawker Hunter F.G.A.9, de Havilland Venom F.B.4. *Maritime Reconnaissance:* Avro Shackleton M.R.1a, M.R.2c and M.R.3. *Helicopters:* Westland Belvedere H.C.1, Westland Whirlwind H.A.R.2 and 10, and H.C.C.8, Bristol Sycamore H.R.14. *Trainers:* Folland Gnat T.1, de Havilland Vampire T.11, Hunting Jet Provost T.3 and T.4, Hunting Provost T.1.

Vickers Valetta T.3, Vickers Varsity T.1, Gloster Meteor N.F.(T).14, de Havilland Chipmunk T.10 and T.20, Hawker Hunter F.4 and T.7, English Electric Canberra T.4 and T.11, Avro Lincoln B.2, Bristol Sycamore H.R.14. *Communications:* Hunting Pembroke C.1, de Havilland Devon C.1, Avro Anson C.19. *Miscellaneous:* Handley Page Hastings Met.1.

British naval aviation, the Fleet Air Arm, has been immersed in a major re-equipment programme designed to provide the force with four modern operational fixed-wing aircraft, the two-seat Sea Vixen all-weather strike and interceptor fighter, the single-seat Scimitar day fighter and strike aircraft, the Gannet A.E.W.3 three-seat early warning aircraft, and the Buccaneer two-seat low-level strike aircraft. The first squadron to be equipped with the last-mentioned type will be formed in 1962. For the anti-submarine warfare rôle, the Wessex H.A.S.1 helicopter is being introduced. The Royal Navy operates the carriers *Albion*, *Ark Royal*, *Bulwark*, *Centaur*, *Eagle*, *Hermes* and *Victorious*. The *Bulwark* and *Albion* are being modified as Commando Carriers and will operate forces of commando-carrying helicopters. Ashore, the F.A.A. has air stations at Abbotsinch, Arbroath, Brawdy, Culdrose, Lee-on-Solent, Lossiemouth, and Yeovilton, and it also uses the Naval Air Station at Hal Far, Malta.

The F.A.A. has some six squadrons of Sea Vixen F.A.W.1s, including Nos. 766, 890, 891, 892 and 893, the first of these having been commissioned on July 2, 1959 (No. 892 Squadron), and a number of Scimitar squadrons, including Nos. 736, 764, 800, 803, 804 and 807. The last Sea Hawk squadron in first-line service, No, 806, was disbanded on December 15, 1960, and all Sea Hawks and Sea Venoms are being progressively retired. The Gannet A.E.W.3 early warning aircraft equips No. 849 Squadron, and a number of helicopter units are being progressively formed. At the present time, the Whirlwind H.A.S.7 operates with more than a half dozen squadrons, and the Dragonfly H.C.3 is employed by No. 705 Squadron and communications flights, but the Sea Scout and the Wessex are undergoing trials with No. 700H Squadron, and the latter is now being introduced into operational service, the first Wessex squadron being scheduled to embark on the *Ark Royal* in the Autumn of 1961. The Sea Scout light torpedo-carrying helicopter will arm the new *Leander* and *Tribal* class frigates.

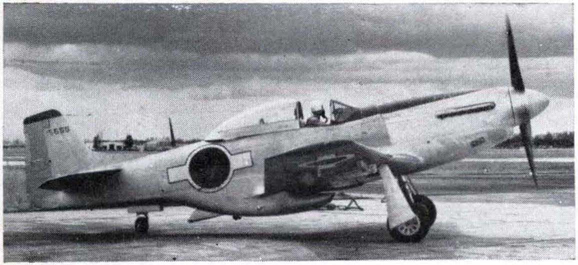
Various trainers are used by the F.A.A., including the Sea Balliol T.21 (Nos. 727 and 781 Squadrons), the Sea Vampire T.22 (No. 738 Squadron and communications flights), the Hunter T.8 (Nos. 736 and 764 Squadrons), and the Sea Prince T.1 (Nos. 727 and 750 Squadrons and communications flights). No. 728 Squadron operates Meteor T.T.20 target-tugs and Firefly U.9 target aircraft. Training schools include the Naval Observer School at Culdrose, the Helicopter Conversion School, the Operational Flying Schools, the Aircraft Handling and Fire-fighting School, the School of Aircraft Maintenance and the School of Photography.

Strike Fighters: Supermarine Scimitar F.1, de Havilland Sea Vixen F.A.W.1. *Strike:* Blackburn Buccaneer S.1. *Early Warning:* Fairey Gannet A.E.W.3. *Helicopters:* Westland Wessex H.A.S.1, Westland Sea Scout, Westland Whirlwind H.A.S.7, Westland Dragonfly H.C.3, Hiller HTE-2. *Trainers:* Hawker Hunter T.8, de Havilland Sea Vampire T.22, Boulton Paul Sea Balliol T.21, Hunting Sea Prince T.1. *Communications:* De Havilland Sea Devon C.20, Hunting Sea Prince C.2, de Havilland Dominie C.1, de Havilland Heron. *Miscellaneous:* De Havilland Sea Venom F.A.W.21 and 22, Armstrong Whitworth Sea Hawk F.B.5 and F.G.A.6, Fairey Gannet A.S.1 and A.S.4, Gloster Meteor T.T.20, Fairey Firefly U.9.

The Army Air Corps officially came into existence in September 1957, and its rôles are reconnaissance and liaison in the battlefield area. Air and ground crews are trained at the Army Air Corps Centre at Middle Wallop, training being given on Auster T.7s, Chipmunks and Skeeter helicopters. The basic unit is the flight which normally comprises three fixed-wing aircraft and three helicopters, and the number of flights per squadron varies according to the needs of the formation concerned. Two Lancashire Aircraft Prospectors have been evaluated by the Army Air Corps, the delivery of thirty-six DHC-2 Beavers began in 1960, and after six months' evaluation of two SE-3130 Alouette II helicopters, five were ordered for the Army Air Corps in December 1960, and a further twelve in January 1961. Another turbine-powered helicopter to be delivered to the Army Air Corps during the course of 1961 is the Westland P.531–2 Scout, a substantial production order for which was announced in September 1960.

Utility Transports: De Havilland DHC-2 Beaver. *Air Observation Posts:* Auster A.O.P.9, Lancashire Aircraft Prospector. *Helicopters:* Saunders-Roe Skeeter A.O.P.10, Sud-Aviation SE-3130 Alouette II, Westland P.531–2 Scout. *Trainers:* De Havilland Chipmunk T.10, Auster T.7.

GREECE. The Royal Hellenic Air Force possesses four combat wings, three of which are equipped with F-84F Thunderstreak and F-100D Super Sabre fighter-bombers and one with Canadair Sabres. There is also one reconnaissance fighter squadron



An F-51D Mustang of the Haitian Corps d'Aviation

equipped with the RF-84F Thunderflash, one helicopter squadron equipped with the Sikorsky H-19, and a transport squadron in addition to training, liaison and communications elements. The fighter-bomber wings which each comprise three squadrons and the reconnaissance fighter squadron are assigned to N.A.T.O. as the 28th Tactical Air Command of the 6th A.T.A.F. A considerable proportion of the Air Force's pilots and technicians have been trained by the U.S.A.F. in Germany and the U.S.A., and personnel strength is approximately 18,000 officers and men. The R.H.A.F. sold 50–70 Republic F-84G Thunderjet fighter-bombers to Yugoslavia in the summer of 1960, these having been virtually withdrawn from active service and issued to second-line fighter-bomber squadrons. The R.H.A.F. plans to re-equip two squadrons with the Fiat G.91, and it is anticipated that F-104G Starfighters will eventually be delivered.

A transport conversion of the P4Y-2 Privateer of Honduras

Fighters: Canadair CL-13 Sabre Mks. 2 and 4. *Fighter-bombers:* North American F-100D Super Sabre, Republic F-84F Thunderstreak. *Reconnaissance Fighters:* Republic RF-84F Thunderflash. *Transports:* Douglas C-47, Beech C-45. *Helicopters:* Sikorsky H-19. *Trainers:* Canadair T-33A-N, North American T-6 Texan. *Communications:* Ryan Navion, Stinson L-5.

GUATEMALA. The *Fuerza Aérea de Guatemala* (Guatemalan Air Force) is a small air arm administered by the Army and possessing one fighter-bomber squadron equipped with F-51D Mustangs, one light bomber squadron equipped with the B-26 Invader, and one transport squadron which, equipped with C-47s, operates a number of internal passenger services in addition to normal military duties. There is a training squadron based at Los Cipresales airfield near Guatemala City, and this unit also carried out some survey and internal policing duties. During 1960, three military airfields capable of handling jet aircraft were being built in Guatemala by the U.S. government, and at the end of the year eight additional B-26 Invaders were received from the U.S.A.

Fighter-bombers: North American F-51D Mustang. *Bombers:* Douglas B-26 Invader. *Transports:* Douglas C-47. *Helicopters:* Hiller UH-12B. *Trainers:* North American T-6 Texan, Boeing-Stearman PT-17 Kaydet, Beech T-11B Kansan, Vultee BT-15 Valiant, Ryan STM-2.

GUINEA. The West African Republic of Guinea is in process of forming a small air arm with the assistance of the Communist bloc. Guinea has reportedly been promised twenty-five MiG-17 fighters as a gift from the Soviet Union.

HAITI. The Haitian *Corps d'Aviation* (Air Corps) is a branch of the *Garde D'Haiti* and has a composite squadron based at Bowen Field, Port-au-Prince, and equipped with a few F-51D Mustang fighter-bombers and various training aircraft which are also used for internal policing and coastal patrol. The small transport element operates the President's Model 307 Stratoliner.

Fighter-bombers: North American F-51D Mustang. *Transports:* Douglas C-47, Boeing 307 Stratoliner, Beech C-45, Cessna C-78. *Trainers:* North American T-6 Texan, Vultee BT-13A Valiant, Fairchild PT-19, Boeing-Stearman PT-17 Kaydet, Beech T-11 Kansan.

HONDURAS. The Honduran Republic possesses a small air arm administered by the *Departemento de Aviaciòn.* No combat aircraft have been acquired since the early 'fifties when small numbers of F-51D Mustangs and Republic F-47D Thunderbolts were received from the U.S.A. to re-equip the single combat squadron. The most recent acquisitions have been several demilitarised P4Y-2 Privateers to supplement the C-47s and C-45s of the transport squadron.

Fighter-bombers: North American F-51D Mustang, Republic F-47D Thunderbolt. *Transports:* Convair P4Y-2 Privateer, Douglas C-47, Beech C-45. *Trainers:* North American T-6 Texan, Boeing-Stearman PT-13 Kaydet, Fairchild PT-23, Beech AT-11.

HUNGARY. The Hungarian Air Force, re-established after the abortive uprising of October 1956, has received little modern equipment in recent years, and little is known of the present status of its operational elements. Before the uprising these comprised three Fighter Regiments at full strength with seventy MiG-15 fighters each, and a fourth Regiment with thirty MiG-15s. There were also six independent fighter groups, at least two of which were equipped with the all-weather version of the MiG-17, two Attack Regiments equipped with Il-10s and two Bomber Regiments, one of which was in process of converting from the Tu-2 to the Il-28. Since the October uprising, the first-line strength of the Hungarian Air Force has reportedly been reduced substantially, and is now concerned primarily with the fighter defence of strategic targets, internal security, co-operation with the Army, training and communications.

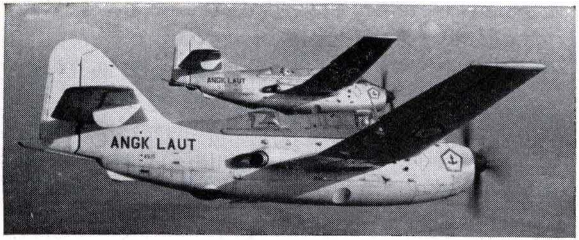
Fighters: MiG-15, MiG-17. *Bombers:* Il-28. *Helicopters:* Mi-4. *Transports:* Li-2, An-2, Il-14M. *Trainers:* Yak-18, Yak-11, MiG-15UTI. *Liaison:* Yak-12, Fieseler Fi 156C Storch.

INDIA. The most powerful and modern air arm in Southern Asia, the Indian Air Force has been progressively expanded in recent years and now possesses some twenty first-line operational squadrons. Essentially a tactical air arm, its operational elements comprising interceptors, fighter-bombers and light bombers, the I.A.F. has approximately four squadrons of Mystère IVA interceptors, some six squadrons of Hunter Mk. 56 fighter/ground attack aircraft (equivalent to the R.A.F.'s Hunter F.G.A.9), and four squadrons of Canberra B.(I).8 and B.(I).58 light bombers. There is one photo-reconnaissance unit equipped with the Canberra P.R.57, and one or two squadrons are still equipped with the Ouragan (known in the I.A.F. as the *Toofani*) and Vampire F.B.9 fighter-bombers, these currently being in process of replacement by the Gnat Mk. 1.

Apart from the I.A.F.'s Operational Command which exercises control over all combat units, a new major formation, the Eastern Air Command was formed in Calcutta in 1960 to meet the I.A.F.'s growing responsibilities of air defence and for air support of the Army in the areas of the Republic bordering China, Burma and East Pakistan. There are two other commands, the Training Command and the Air Material Command. The Training Command includes the Air Force Flying College at Jodhpur and two flying training wings at Hyderabad. Preliminary training is undertaken on the indigenous HT-2 from which pupils progress to the T-6G Texan. Subsequently fighter and light bomber pilots convert to the Vampire T.55 before completing their training on the Hunter Mk. 66 and Canberra T.4 respectively. Transport pilots complete their training on the C-47. In addition to its own personnel, the I.A.F. is training Indonesians, and I.A.F. personnel have been detached to the Ghanaian Air Force and the United Arab Republic Air Force.

Two Canberra B.(I).58 bombers of the Indian Air Force

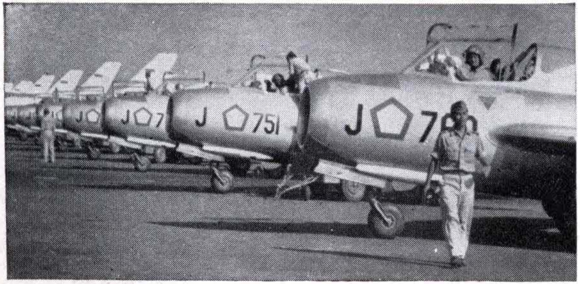
The I.A.F.'s hard-worked transport squadrons which currently operate the survivors of some seventy C-47s acquired in the 'forties, twenty-six C-119Gs obtained in 1954, and twenty-six DHC-3 Otters purchased in 1957–8, plus two Il-14s, a Viscount 723 and a Viscount 730, began to receive eight Antonov An-12 aft-loading heavy transports in March



Gannet A.S.4s of the Angkatan Laut Republik Indonesia

1961, and also expect to receive the first Avro 748s which, together with the military version of this aircraft, the Avro 757, will replace the elderly C-47s. The Avro transports are being manufactured at Kanpur, and it is reported that the I.A.F. will require about 130 of these transports. The transport squadrons undertake various civic missions in addition to their normal military duties, such as aerial survey, anti-locust and anti-malarial operations, refugee evacuation and supply dropping. The I.A.F. operates small numbers of Sikorsky S.55 and Bell 47G-2 helicopters, and, in 1960, purchased two Sikorsky S.62B helicopters for trials. The I.A.F. is, however, in urgent need of additional rotorcraft suitable for use on India's Himalayan frontier, and negotiations were conducted with the Soviet government late in 1960 for the supply of ten Mi-4 helicopters.

MiG-15UTIs of an Indonesian operational conversion unit



Since 1954, the I.A.F. has received 104 Ouragans and 110 Mystère IVAs from France, and 160 Hunter Mk. 56s, sixty-six Canberra B.(I).8s and B.(I).58s, eight Canberra P.R.57s, and twenty Gnat Mk. 1s from the United Kingdom. Twenty sets of Gnat Mk. 1 components have been supplied to India, and these have been assembled by Hindustan Aircraft who are also building about 100 additional Gnats under licence, but the Gnat is looked upon as an interim fighter pending the introduction of the indigenous Hindustan HF-24 supersonic fighter in 1962.

Apart from the regular I.A.F., there is an Auxiliary Air Force which, during 1960, was increased from five to seven squadrons—Nos. 51 (Delhi), 52 (Bombay), 53 (Madras), 54 (Allahabad), 55 (Calcutta), 56 (Bhuvaneshwar) and 57 (Chandigarh). Equipped principally with HT-2 and T-6G trainers, these squadrons train civilians on a part-time basis, but during 1960 a jet flight was added to No. 51 Squadron and additional jet flights are in process of formation.

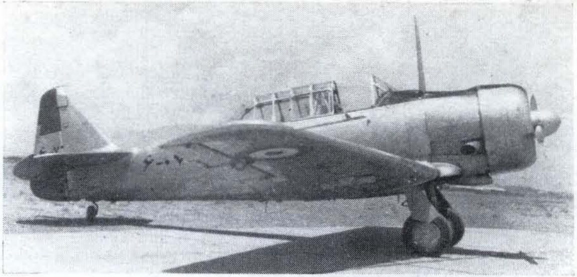
Fighters: G.A.M. Dassault Mystère IVA, Folland Gnat Mk. 1. *Fighter-bombers:* Hawker Hunter Mk. 56, de Havilland Vampire F.B.52 Dassault Ouragan. *Bombers:* English Electric Canberra B.(I).8 and B.(I).58. *Reconnaissance:* English Electric Canberra P.R.57. *Transports:* Fairchild C-119G, Antonov An-12, Avro 748, de Havilland DHC-3 Otter, Douglas C-47, Ilyushin Il-14, Vickers Viscount 723 and 730. *Helicopters:* Bell 47G-2, Sikorsky S.55, Sikorsky S.62B. *Trainers:* Hawker Hunter Mk. 66, English Electric Canberra T.4, de Havilland Vampire T.55, North American T-6G Texan, Hindustan HT-2, Dassault Ouragan, Douglas C-47. *A.O.P.:* Auster A.O.P.9.

Indian naval aviation is built up around the Indian Navy's sole aircraft carrier, the *Vikrant*, for which fifteen Breguet Alizés have been purchased for No. 310 shipboard anti-submarine squadron, and twenty-one Sea Hawk F.G.A.6s have been acquired to equip No. 300 Squadron which will also be based aboard the carrier. Apart from these two operational squadrons, Indian naval aviation is largely confined to a Fleet Requirements Unit with Sealand amphibians, five Firefly T.T.1 and five T.T.4 target-tugs, and a few HT-2 trainers.

Fighter-bombers: Hawker Sea Hawk F.G.A.6. *Anti-submarine:* Breguet 1050 Alizé. *Communications:* Short Sealand. *Target-tugs*: Fairey Firefly T.T.1 and T.T.4. *Trainers:* Hindustan HT-2.

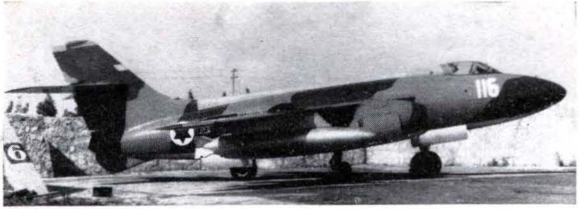
INDONESIA. The *Angkatan Udara Republik Indonesia* (The Indonesian Republican Air Force), or A.U.R.I., has been progressively expanded in recent years. The Indonesian Republic comprises some three thousand islands of which the largest are Java, Sumatra, the Celebes and Borneo, and to facilitate the administration of the A.U.R.I., which is spread thinly over the vast area covered by these islands, the Republic is divided into seven *Distrik Udara*, or Air Areas, which form individual commands, each of which possesses one main base and several auxiliary bases. Despite Indonesia's economic position, a substantial amount of new equipment has been obtained for the A.U.R.I. in recent years. The first jet aircraft arrived in 1955 with the acquisition of eight Vampire T.55s which were employed in both training and policing rôles, and eight SA-16A Albatross amphibians were obtained two years later. Attempts to obtain high-performance combat aircraft from the U.S.A. were unsuccessful, and with a major rebellion against the Central Government in Sumatra in 1958, the Indonesian government reached agreement with the Czechoslovak government for the supply of sixty MiG-15UTI jet trainers and MiG-17 jet fighters, forty Il-28 jet bombers, and twenty-eight Il-14 transports, deliveries of which began before the end of the year. Despite the acquisition of Il-28 jet bombers, in 1960, the Indonesian government acquired a number of surplus B-26B Invader bombers from the U.S.A., together with five C-130B Hercules transports. The C-130Bs are employed for search and rescue missions in addition to logistic and tactical duties, and the Indonesian government has an option on a further five transports of this type. The A.U.R.I. also operates seven DHC-3 Otter utility transports, two of which are equipped as amphibians. Three of these were presented to Indonesia by Canada as a Colombo Plan gift, and are intended primarily to provide transport for remote area development, but their secondary rôle is that of military freight, personnel and paratroop transports. The A.U.R.I. obtained its first large helicopters in 1960 with the delivery of four Mi-4s from the Soviet Union, and during the year evaluated both the Fuji-built Beech Mentor and the Polish TS-8 Bies as potential standard basic training and light policing aircraft. It has been reported that Indonesia is interested in acquiring 100 Mentors of which forty will be fitted with armament. The A.U.R.I.'s Research, Development and Production Depot at the Husein Sastranagara Air Force Base is currently producing the NU-90 Belalang primary trainer.

Fighters: MiG-17. *Fighter-bombers:* North American F-51D Mustang. *Bombers:* Ilyushin Il-28, North American B-25J Mitchell, Douglas B-26B Invader. *Transports:* Lockheed C-130B Hercules, Ilyushin Il-14, de Havilland DHC-3 Otter, Douglas C-47. *Helicopters:* Mil Mi-4. *Search and Rescue:* Convair PBY-5A, Grumman SA-16A Albatross. *Trainers:* MiG-15UTI, de Havilland Vampire T.55, North American T-6G Texan, NU-90 Belalang, Vultee BT-13A Valiant. *A.O.P. and Liaison:* Piper L-4J, Cessna 180.


An Imperial Iranian Air Force T-6G Texan basic trainer

The Indonesian Naval Air Arm, or *Angkatan Laut Republik Indonesia* (A.L.R.I.) was established in 1958, and its first equipment comprises fourteen Gannet A.S.4 anti-submarine aircraft and two Gannet T.5 trainers, deliveries of which were completed during 1961. The Indonesian Navy possesses no carriers, and the A.L.R.I. will be a shore-based force consisting primarily of one anti-submarine and patrol squadron, and flights equipped with amphibians, helicopters and utility aircraft.

A Bristol 170 Mk. 31M of No. 3 Squadron, Iraqi Air Force

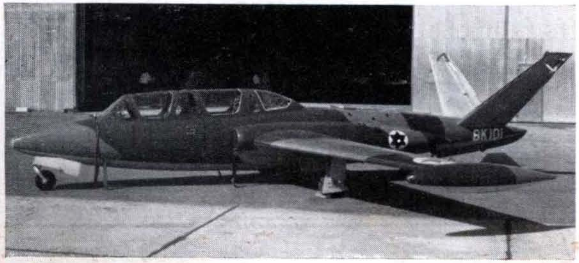


The Heil Avir Le Israel has twenty-five Vautour IIA bombers

IRAN. The Imperial Iranian Air Force currently comprises four wings: the Fighter-bomber Wing equipped with the Republic F-84G Thunderjet, the Air Transport Wing equipped with Douglas C-47s, Beech C-45s, and DHC-2 Beavers, the Training Wing with primary, basic and advanced training aircraft of various types, and the Air Depot Wing. Some of the I.I.A.F.'s aircraft are overhauled at Vizzola in Italy, and most Iranian operational pilots and instructors have received training from the U.S.A.F. which supervises jet training in Iran. Army co-operation and liaison duties are undertaken by Piper PA-18 Super Cubs.

Fighter-bombers: Republic F-84G Thunderjet. *Transports:* Douglas C-47, Beech C-45, de Havilland DHC-2 Beaver. *Liaison:* Piper PA-18 Super Cub. *Trainers:* Lockheed T-33A, North American T-6G Texan, Boeing-Stearman PT-13 Kaydet.

The first of nineteen Magisters assembled for the I.D.F./A.F.



IRAQ. The Iraqi Air Force is believed to possess five operational squadrons of interceptor fighters, fighter-bombers, and light bombers, one army co-operation squadron and one transport squadron. Most operational squadrons are based at Rashid, near Baghdad, and Shaiba, near Basrah. One interceptor squadron is equipped with Hunter F.6s, fifteen of which were received before the revolution of July 1958, and another is equipped with the MiG-17. There is one light bomber squadron equipped with the Il-28, and two fighter-bomber squadrons, one equipped with the Vampire F.B.52, and the other equipped with the Venom F.B.50. The remaining Hawker Fury fighter-bombers which equipped Nos. 1, 4 and 7 Squadrons have now been largely placed in storage. The transport unit, No. 3 Squadron, has received four Bristol 170 Mk. 31M freighters, two Heron Srs. 2s, and seven Doves. The training organisation includes the I.A.F. Flying College with Provosts, Chipmunks and Vampire T.55s at Rashid. In 1959, the British government approved the sale of sufficient Canberra bombers to Iraq to equip one squadron, but the Iraqi government abandoned its plans to obtain this warplane.

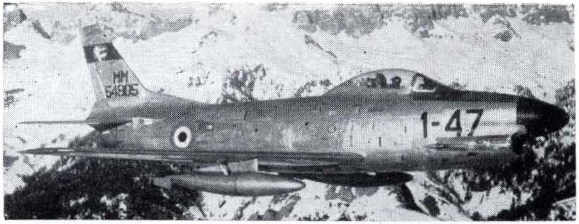
Fighters: Hawker Hunter F.6, MiG-17. *Fighter-bombers:* De Havilland Vampire F.B.52, de Havilland Venom F.B.50, Hawker Fury. *Bombers:* Ilyushin Il-28. *Transports:* Bristol 170 Mk. 31M, de Havilland Heron Srs. 2, de Havilland Dove. *Helicopters:* Westland Dragonfly. *A.O.P.*: Auster A.O.P.6. *Trainers:* Hunting Provost T.53, Auster T.7, de Havilland Vampire T.55, de Havilland Chipmunk T.20, Hawker Fury Trainer.

IRELAND (EIRE). The Irish Air Corps is a small force confined to the training and communications rôles. There are only two military airfields, at Baldonnel, Co. Dublin, and Gormanston, Co. Meath, the former housing the Air Corps Headquarters, the Advanced Flying Wing, the Technical Wing, and other ancillary units, and the latter housing the Basic Training Wing. For training purposes, the Air Corps possesses several Spitfire T.9s and Vampire T.55s, a few Provost T.51s and T.53s, and six Chipmunks. There is one de Havilland Dove (a second Dove having been destroyed in an accident in January 1961) and two Avro Anson 19s for communications and transport duties, and the peacetime establishment provides for a total of 819 officers and men.

Trainers: Hunting Provost T.51 and T.53, Supermarine Spitfire T.9, de Havilland Chipmunk. *Transports:* De Havilland Dove, Avro Anson 19.

ISRAEL. The *Heil Avir Le Israel*, or Israel Defence Force/Air Force (I.D.F./A.F.) is the most efficient and competent of all local Middle Eastern air arms, being maintained at a state of peak efficiency owing to the constant friction between Israel and her Arab neighbours. The operational elements of the I.D.F./A.F. are equipped almost solely with combat aircraft of French origin, and have received in recent years some eighty-five Ouragan fighter-bombers, sixty Mystère IVA interceptors, twelve Super Mystère B2 interceptors and twenty-five Vautour IIA attack bombers. Although the exact strength of the I.D.F./A.F. is uncertain, its first-line operational element is believed to comprise two attack bomber squadrons, five interceptor squadrons and five fighter-bomber squadrons. There are three transport squadrons which operate eight Noratlases and a number of C-46s and C-47s. The Israel Aircraft Industries at Lydda are currently completing the assembly of nineteen Magister jet trainers from components imported from France, and all-through jet training is scheduled to commence shortly with these and the one complete Magister acquired as a prototype. Additional Magisters to be manufactured under licence in Israel will embody a number of modifications to reduce structural weight and render them more suitable for their secondary rôle in the I.D.F./A.F. of close support. During 1960, the Israeli government evinced interest in the acquisition of G.A.M. Dassault Mirage III supersonic interceptors.

Fighters: G.A.M. Dassault Super Mystère B2, G.A.M. Dassault Mystère IVA. *Fighter-bombers:* Dassault Ouragan. *Attack Bombers:* Sud-Aviation SO-4050 Vautour IIA. *Transports:* Nord 2501-IS Noratlas, Curtiss C-46, Douglas C-47. *Trainers:* Potez Air-Fouga Magister, Gloster Meteor T.7, North American Harvard, Boeing-Stearman PT-17 Kaydet, Fokker S-11 Instructor, Airspeed Consul, Avro Anson. *Helicopters:* N.H.I. H-3 Kolibrie, Sud-Aviation SE-3130 Alouette II, Sikorsky S.55, Sikorsky S.58B, Hiller 360. *Miscellaneous:* Gloster Meteor F.8, Convair PBY-5A, Piper Super Cub.



An F-86K Sabre of the 1° Stormo of the Aeronautica Militare

ITALY. The *Aeronautica Militare Italiano* (Italian Military Aviation) provides N.A.T.O.'s 5th A.T.A.F. to which are committed four of the force's six Air Brigades. Each Air Brigade (*Aerobrigata*) of the 5th A.T.A.F. comprises three *Gruppi* of fighter-bombers (equivalent to a U.S.A.F. Wing of three squadrons of twenty-five aircraft) with the exception of one (3ª *Aerobrigata*) which has two *Gruppi* of tactical reconnaissance aircraft. The 5ª *Aerobrigata* consists of *Gruppi* 101° and 102° equipped with the F-84F Thunderstreak and 103° with the Fiat G.91; the 6ª *Aerobrigata* comprises the 154°, 155° and 165° *Gruppi* with F-84F Thunderstreaks; the 51ª *Aerobrigata* includes the 20°, 21° and 22° *Gruppi*, also equipped with the F-84F Thunderstreak, and the 3ª *Aerobrigata* comprises *Gruppi* 28° and 132ª equipped with the RF-84F Thunderflash. Of the two remaining Air Brigades, the 4ª *Aerobrigata* is a day interceptor formation assigned to home defence and consisting of the 9°, 10°, and 12° *Gruppi* equipped with the Sabre Mk. 4, and the 46ª *Aerobrigata* is the transport element with the C-119G-equipped *Gruppi* 2° and 98°. There are also two independent *Stormi* assigned to home defence, the 1° *Stormo* with all-weather F-86K Sabres and the 2° *Stormo* with Sabre Mk. 4s. The only other operational units in the *Aeronautica Militare* are the anti-submarine *Gruppi* 86° and 87° equipped with the S2F-1 Tracker. At the present time, the bulk of the equipment of the *Aeronautica Militare* is approaching obsolescence, and late in 1960 it was decided to build the F-104G Super Starfighter multi-purpose fighter in Italy. The *Aeronautica Militare* will receive 125 F-104Gs of which fifty will be paid for by U.S. mutual aid funds. To date, only sufficient Fiat G.91 strike fighters to re-equip one *Gruppo* have been ordered.

The *Aeronautica Militare*'s Air Rescue Command operates air/sea rescue centres at Milan, Taranto, Augusta and Elmas with Grumman SA-16A Albatross amphibians. An Air Staff Flying Unit which is responsible, among other duties, for the transportation of V.I.P.s, is equipped with Douglas C-47s and Beech C-45s plus one Convair 440, but these are to be supplemented by six Convair 440s purchased from Alitalia and twenty-one Piaggio P.166 light transports. The Air Force Instruction Board is responsible for all training apart from the Tactics and Gunnery Training School, the All-weather

F-86D Sabre all-weather fighters of the Japanese Air Self-Defence Force's 102nd Wing at the Komaki Air Base

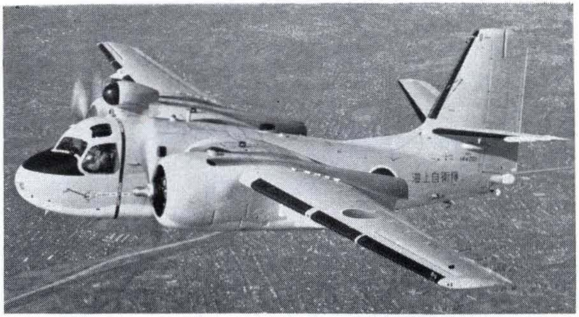
Fighter Flying School and the Central School for Flying Instructors which come under the supervision of the Jet Training Command. At the present time, the Macchi M.B.326 is being introduced as a replacement for the T-6 Texan, and during the course of 1961, the schools will begin to take delivery of twenty-five two-seat Fiat G.91Ts. The Helicopter Centre is equipped primarily with the Agusta-Bell 47G and 47J, and has training and rescue tasks as well as operational commitments, and since 1959, the Italian Navy has operated a number of Sikorsky HSS-1 on anti-submarine and other specialised missions. The Italian Navy also exercises operational control of the Tracker anti-submarine aircraft of *Gruppi* 86° and 87°.

Fighters: Canadair CL-13 Sabre Mk. 4, Fiat/North American F-86K Sabre. *Fighter-bombers:* Republic F-84F Thunderstreak, Fiat G.91. *Reconnaissance Fighters:* Republic RF-84F Thunderflash. *Anti-submarine:* Grumman S2F-1 Tracker. *Transports:* Douglas C-47, Beech C-45, Convair 440, Fairchild C-119G, Piaggio P.166. *Helicopters:* Agusta-Bell 47G and 47J, Sikorsky S.58. *Trainers:* Macchi M.B.326, Fiat G.91T, Lockheed T-33A, Piaggio P.148, Macchi M.416, North American T-6 Texan, Fiat G.59, Fiat G.82. *Search and Rescue:* Grumman SA-16A Albatross.

JAPAN. The Japanese Self-Defence Forces possess three air components: the Air Self-Defence Force (J.A.S.D.F.), and the aviation sections of the Maritime and Ground Self-Defence Forces (J.M.S.D.F. and J.G.S.D.F. respectively). With U.S. aid, these forces have been progressively expanded since 1954, and the J.A.S.D.F. alone currently possesses more than 1,000 aircraft of all types and a personnel strength of 28,000 officers and men. Present plans call for a first-line strength of twenty fighter squadrons with a total of 500 interceptors in 1965. This strength will be made up of 225 F-104J Starfighters, 100 F-86D Sabres and 175 F-86F Sabres. In addition, there will be fifty F-86F Sabres with operational training units, three squadrons of transport aircraft totalling forty-eight machines, a sixteen-plane squadron of early warning aircraft, and two squadrons of reconnaissance aircraft with a total of thirty-six machines. There will also be approximately 1,000 trainers, helicopters, communications, and other aircraft. The J.A.S.D.F. possesses three day interceptor fighter wings equipped with F-86F Sabres and one all-weather interceptor wing equipped with the F-86D Sabre. Each wing has a statutory strength of three squadrons of twenty-five aircraft. Two of the day fighter wings are based at Chitose, Hokkaido, and Komaki, Nagaya, where the all-weather wing is also based, and the third day fighter wing based at Hamamatsu, Matsushima, is also an advanced flying school. There are three transport squadrons each with a statutory strength of sixteen C-46s, and one reconnaissance fighter squadron with eighteen RF-86F Sabres, and the training organisation includes seven Flight Training Wings. At the present time, the indigenous Fuji T1A jet trainer is being introduced, and J.A.S.D.F. personnel are undergoing familiarisation training in the U.S.A. on the Starfighter, current plans calling for Mitsubishi to manufacture 180 examples of this fighter for the J.A.S.D.F. by 1965, together with twenty two-seat conversion training variants. The following are the proposed totals of each aircraft type in J.A.S.D.F. service at the end of 1961, figures in parentheses relating to the totals at the end of 1960: F-86D Sabre, 110 (113); F-86F Sabre, 345 (377); RF-86F Sabre, 18 (18); F-104J Starfighter, 1 (0); Fuji T1A, 41 (20); C-46, 44 (46); T-33A, 245 (252); T-6 Texan, 126 (150); T-34 Mentor, 135 (136); H-19A, 20 (19); H-21B, 10 (0).

Fighters: North American F-86F Sabre, North American F-86D Sabre. *Reconnaissance Fighters:* North American RF-86F Sabre. *Transports:* Curtiss C-46D. *Helicopters:* Sikorsky H-19A. *Trainers:* Lockheed T-33A, Fuji T1A, Fuji-Beech T-34 Mentor, North American T-6G Texan.

The Maritime Self-Defence Force (J.M.S.D.F.) provides a force for the patrol of Japanese waters and the defence of Japanese shipping, and although the J.M.S.D.F. possesses no carriers at the present time, the construction of a helicopter carrier of 10,000 tons will begin during 1961. The J.M.S.D.F. possesses a strong anti-submarine element with thirty P2V-7 Neptunes and sixty S2F-1 Trackers, and will have a further ten Neptunes by the end of 1961. There are also fourteen Sikorsky HSS-1s and six Grumman UF-1 Albatross amphibians for anti-submarine duties, and the J.M.S.D.F. anticipates receiving a further nine UF-1s in order to form five three-plane flights, one flight being stationed at each of the J.M.S.D.F. bases. There is a small transport element with four Douglas R4Ds, and the J.M.S.D.F. undertakes its own flying training, currently possessing forty-six SNJ-6 and thirty-four SNB-4 trainers. During 1961, it is hoped to replace the ageing SNJ-6s with forty Fuji KM-2 trainers. A start will also be made on replacing the SNB-4s with the delivery of six Beech L-23Fs. The principal J.M.S.D.F. bases are Hachine, Ominato, Tateyama, Kanoya, Omura, and Tokushima, and present plans call for the formation of eight anti-submarine patrol and maritime reconnaissance squadrons.

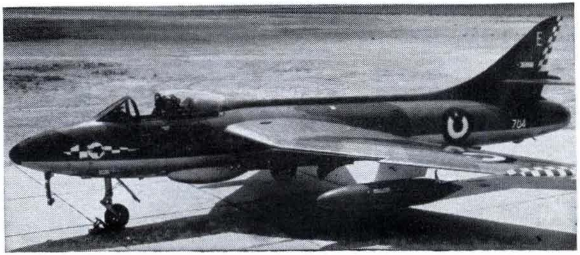


An S2F-1 Tracker of the Japanese Maritime Self-Defence Force

Maritime Reconnaissance: Lockheed P2V-7 Neptune. *Anti-submarine:* Grumman S2F-1 Tracker. *Transports:* Douglas R4D. *Helicopters:* Sikorsky S.55A and C, Sikorsky HSS-1, Bell 47G. *Trainers:* North American SNJ-6, Beech SNB-4. *Target-tugs:* Grumman TBM-3S-2.

The Ground Self-Defence Force (J.G.S.D.F.) possesses a substantial quantity of helicopters and light aircraft for

A Hunter F.6 of the Royal Jordanian Air Force



reconnaissance and liaison missions in co-operation with ground troops. The aviation elements comprise a number of Special Corps Air Forces: 1st (Hokkaido), 2nd (Hokkaido), 3rd (Osaka), 4th (Saga), 5th (Hokkaido), 6th (Miyagi), and 9th (Aomori), and at the end of 1960, these units, together with the Northern and Western District Air Forces and the air unit attached to the Ground Staff Office, possessed some 210 light aircraft, and about 65 helicopters.

Liaison and A.O.P.: Convair L-5, Piper L-21, Cessna L-19 Bird Dog, Fuji LM-1. *Helicopters:* Sikorsky H-19, Bell H-13, Vertol 44.

JORDAN. The Royal Jordanian Air Force is a small defensive arm consisting of one interceptor fighter squadron, one fighter-bomber squadron, and transport, training, liaison and A.O.P. elements. The Jordanian government received twelve Hunter F.6s late in 1958, plus one Hunter F.R.6, these aircraft being paid for by the U.S.A. under the O.S.P. programme, and Jordan hopes to receive two more squadrons of Hunters and has since acquired two Hunter T.66B two-seat trainers. Two Heron 2D light transports were acquired late in 1958, and at the end of the following year, two Airspeed Ambassadors were purchased from British European Airways. The most recent purchase for the R.J.A.F. comprised two Whirlwind helicopters received in August 1960.

The R.O.K.A.F. has two F-86F Sabre-equipped Day Fighter Wings

Fighters: Hawker Hunter F.6. *Fighter-bombers:* De Havilland Vampire F.B.9 and F.B.52. *Reconnaissance:* Hawker Hunter F.R.6. *Transports:* Airspeed Ambassador, de Havilland Heron 2D, de Havilland Dove. *Communications and Liaison:* Beech Twin-Bonanza, Auster Autocrat. *A.O.P.:* Auster A.O.P.6 and 7. *Trainers:* Auster Aiglet, de Havilland Chipmunk T.10, G.T.A.F. Gomhouria, North American Harvard 2B, de Havilland Vampire T.55, Hawker Hunter T.66B.

KATANGA. The Congolese province of Katanga which broke away from the Congolese Republic as an autonomous state under President Moishe Tshombe established the nucleus of an air arm late in 1960. Known as the Katanga Air Force, this air arm initially comprised several aircraft formerly owned by the Belgian *Aviation de la Force Publique*, and a number of civil aircraft impressed by the Katanga government. These included ten de Havilland Doves, twelve Harvard 2Bs fitted with machine guns, three Douglas C-47s, several light aircraft and two helicopters. In January 1961, six light aircraft were acquired from South Africa, and in February the Katanga government placed orders for nine Magister jet trainers and four ex-*Armée de l'Air* Mystère IVA jet fighters. The first three Magisters reached Katanga on February 15th, but the French government reportedly placed an embargo on the export of the Mystères. The Katanga Air Force's aircraft are flown by foreign pilots with Belgians in the majority, and these have been used against Lumumbist forces, the first sorties taking place late in January 1961 when hand grenades were dropped on the townships of Muyumba and Mulongo.

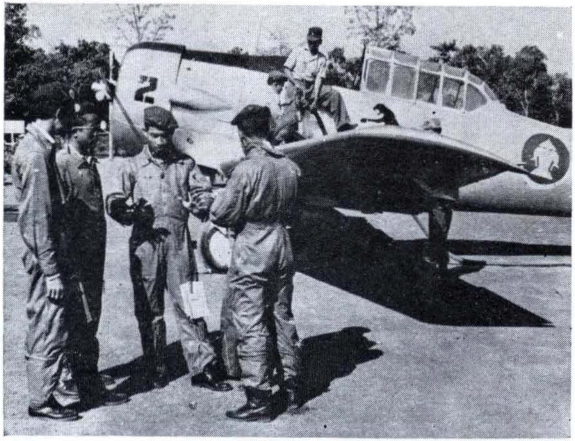
Trainers: Potez Air-Fouga CM-170 Magister, North American Harvard 2B. *Transports:* Douglas C-47, de Havilland Dove, de Havilland Heron. *Helicopters:* Westland-Sikorsky S.51, Sud-Aviation SE-3130 Alouette II. *Liaison and A.O.P.:* Cessna 120, Cessna 180.

KOREA (REPUBLIC OF). The Republic of Korea Air Force's operational element comprises two day fighter wings of F-86F Sabres, each comprising three squadrons of twenty-five aircraft, but in November 1960, the first F-86D Sabres were delivered to Korea, and an all-weather interceptor squadron is now in process of formation. The R.O.K.A.F.'s immediate aim is an interceptor force of three wings (225 aircraft) to provide an effective defensive arm for the southern half of the Korean peninsula should there be any future resumption of hostilities with the Democratic People's Republic of Korea in the North. A request has been made to the U.S.A. for fifty F-100 Super Sabres. Preliminary, basic and advanced training is undertaken in Korea under U.S.A.F. supervision, and there are small transport, liaison and A.O.P elements.

Fighters: North American F-86D Sabre, North American

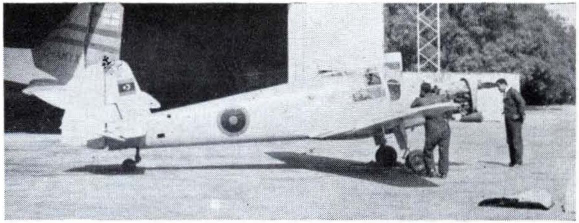
F-86F Sabre. *Transports:* Curtiss C-46, Aero YL-26A, Douglas VC-47D. *A.O.P.:* Cessna L-19A Bird Dog. *Trainers:* Lockheed T-33A, North American T-6A Texan, Piper L-4J.

KOREA (DEMOCRATIC PEOPLE'S REPUBLIC OF). The Korean People's Armed Forces Air Force, or K.P.A.F.A.F., is believed to comprise seven operational Air Divisions each consisting of three Air Regiments of thirty-five aircraft. Four of the Air Divisions are interceptor units equipped with MiG-15s and MiG-17s, one is a bomber formation equipped with the Il-28, and the remaining Air Divisions are ground attack formations with MiG-15s. The development of the K.P.A.F.A.F. has been closely supervised by Russian and Sino-Communist advisors and instructors, and it possesses 1,000 aircraft of all types. This total includes 350 MiG-15s, 360 MiG-17s and a few MiG-19s, and personnel strength is 33,000 officers and men.



Laos uses armed T-6 Texans for close-support duties

Fighters: MiG-19, MiG-17, MiG-15. *Bombers:* Il-28, Tu-2. *Fighter-bombers:* MiG-15. *Transports:* Il-12, Li-2, An-2. *Trainers:* Yak-11, Yak-18, MiG-15UTI, Il-28U.

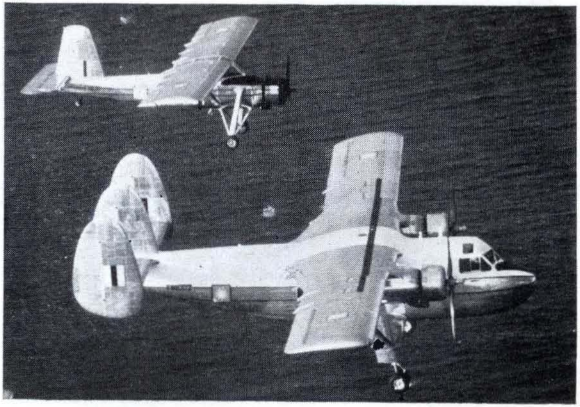


The Libyan air arm has two G.T.A.F. Gomhouria Mk. 1 trainers

KUWAIT. The small Shaikhdom of Kuwait which extends along the shore of the Persian Gulf from Iraq to Saudi Arabia, plans to establish a small defensive air arm, the operational element of which is expected to consist of six Hawker Hunters. It is proposed that R.A.F. instructors and technicians will be stationed in Kuwait to train Kuwaiti personnel.

LAOS. The Laotian Army Aviation Service is essentially an internal policing force consisting of army co-operation flights

A Pioneer and a Twin Pioneer of the Royal Malayan Air Force



An ex-R.C.A.F. Vampire F.3 of the Fuerza Aérea Mexicana

and a small transport element. Apart from two SE-3130 Alouette II helicopters and a few M.S.500 Criquet monoplanes, the entire equipment of the L.A.A.S. has been furnished by the U.S. government which has provided twenty L-19 Bird Dogs, four Aero Commanders, three Beavers, ten C-47s, and, in January 1961, ten T-6 Texans and four Sikorsky HUS-1 helicopters. During fighting between government forces and Pathet Lao rebels, the Texans were fitted with machine guns and rocket rails, and used in the close-support rôle. There are some twenty-five airstrips in Laos capable of accommodating C-47-type aircraft, but only three capable of supporting larger transports, these being Vientiane, Seno, and Pakse.

Army Co-operation: Cessna L-19A Bird Dog, Morane-Saulnier M.S.500 Criquet. North American T-6 Texan. *Helicopters:* Sud-Aviation SE-3130 Alouette II, Sikorsky HUS-1. *Transports:* Douglas C-47, de Havilland DHC-2 Beaver, Aero Commander 520.

One of six MH.1521M Broussards of the Royal Moroccan Air Force

LEBANON. The Lebanese Air Force possesses one interceptor squadron and one fighter-bomber squadron. There is a training school at Rayack which provides primary, basic, advanced and a certain amount of technical training, and there are transport, communications and liaison flights. The Lebanese Air Force received six Hunter F.6s which were paid for by the U.S.A. under the O.S.P. programme, the first of these arriving in November 1958.

Fighters: Hawker Hunter F.6. *Fighter-bombers:* De Havilland Vampire F.B.52. *Transports:* S.I.A.I.-Marchetti S.M.79, de Havilland Dove. *Communications:* Percival Prentice, Macchi M.B.308. *Trainers:* De Havilland Chipmunk T.20 and T.30, North American Harvard T.2B, de Havilland Vampire T.55.

LIBYA. During 1959, a small Libyan air arm was established with the receipt of two Gomhouria primary trainers from the United Arab Republic. These trainers are currently based at Idris, but no plans for any expansion of the air arm have been revealed.

Trainers: G.T.A.F. Gomhouria.

MALAYA. The Royal Malayan Air Force is a one-squadron composite force, providing support for the Malayan Army and Navy, and undertaking jungle supply and internal security for which tasks it operates four Pioneers and four Twin Pioneers. Flying training is undertaken on Chipmunks under R.A.F. supervision and in February 1961 the first three of a quantity of six Hunting Provosts were delivered. It is anticipated that the Royal Malayan Air Force will eventually acquire several helicopters. A further ten Twin Pioneer Srs. 3s were ordered early in 1961 for delivery in 1962. The four existing R.M.A.F. Twin Pioneers are to be converted to Series 3 standard.

Transports: Scottish Aviation Pioneer, Scottish Aviation Twin Pioneer. *Trainers:* Hunting Provost, de Havilland Chipmunk T.10.

MEXICO. The *Fuerza Aérea Mexicana* (Mexican Air Force) is primarily a policing and training force divided into four groups with a total of ten squadrons and a personnel strength of 3,550 men. The bulk of the aircraft currently operated by the *Fuerza Aérea* are obsolescent, and the most recent acquisitions include fifteen former R.C.A.F. Vampire F.3s, Mexico's first jet aircraft, and thirty former U.S.A.F. T-28A trainers. The Vampires will presumably replace the F-47D Thunderbolts in the *Fuerza Aérea*'s sole operational squadron, and the T-28As will take over the policing rôle hitherto performed by Douglas A-24 Dauntlesses and North American T-6 Texans. A variety of training aircraft are in service, the most modern of which is the T-34 Mentor; coastal reconnaissance and patrol flights operate the PBY-5A amphibian, and the transport squadron is equipped principally with the C-47 but also operates the F-27 Friendship of the special presidential flight. It is anticipated that a second Friendship will be purchased. The principal bases are Santa Lucia, El Cipres, Ixtepec, Cozumel, Puebla, Guadalajara, and Pie de la Cuesta.

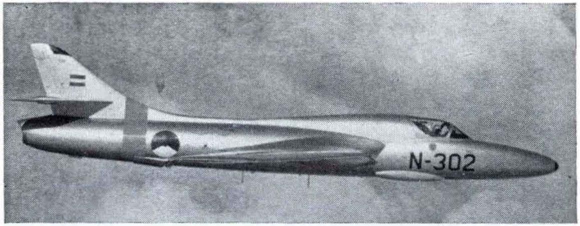
Fighter-bombers: De Havilland Vampire F.3, Republic F-47D Thunderbolt. *Bombers:* North American B-25J Mitchell. *Maritime Reconnaissance:* Convair PBY-5A. *Transports:* Fokker F-27 Friendship, Douglas C-47, Beech C-45. *Trainers:* North American T-28A, Beech T-34 Mentor, Boeing-Stearman PT-17 Kaydet, Fairchild PT-19, North American T-6 Texan, Vultee BT-13 and BT-15 Valiant, Beech AT-7, Beech T-11B Kansan. *Miscellaneous:* Douglas A-24 Dauntless, Stinson L-5E.

MONGOLIA. The Mongolian People's Air Force is believed to be concerned solely with internal communications and transport duties. Mongolian personnel receive technical training at various Soviet aviation institutes, a certain amount of primary and basic flying training is undertaken at two Mongolian schools under Soviet supervision, and all equipment has been supplied by the Soviet Union.

Transports: Ilyushin Il-14P, Li-2, An-2. *Trainers:* Yak-11, Yak 18, UT-2. *Communications:* Po-2.

MOROCCO. The Royal Moroccan Air Force was founded primarily for policing duties, and is currently in an embryo state, but late in 1960 the Moroccan government accepted an offer of Soviet military aid which included jet aircraft, and it is likely that the establishment of an operational element will commence before the end of 1961. Two MiG-15UTI trainers and twelve MiG-17 fighters arrived in Morocco aboard the freighter *Karaganda* on February 10, 1961, and 100 Russian technicians are now training Moroccan personnel. Since November 1957, the Royal Moroccan Air Force has obtained six Holste Broussards from France for use as utility transports, and other acquisitions have included a Heron light transport, a Bell 47 and two Alouette II helicopters, two Twin Bonanzas, and four former-Iraqi Hawker Furies.

Fighters: MiG-17, Hawker Fury. *Trainers:* MiG-15UTI, Morane-Saulnier MS.733 Alcyon. *Transports:* Holste M.H. 1251M Broussard, de Havilland Heron. *Communications:* Beech E50 Twin Bonanza. *A.O.P.:* Morane-Saulnier M.S.500 Criquet. *Helicopters:* Bell 47, Sud-Aviation SE-3130 Alouette II.



A Hunter T.7 trainer of the Koninklijke Nederlandse Luchtmacht

MUSCAT AND OMAN. The independent State of Muscat and Oman established the nucleus of a small air arm entitled The Sultan of Muscat's Own Air Force (S.M.O.A.F.) for internal security and border patrol in 1959. Its first aircraft were two ex-R.A.F. Pioneer C.C.1 utility transports, and these were followed in 1960 by three armed Provost trainers. Aircraft of the S.M.O.A.F. are maintained by Airwork.

Trainers: Hunting Provost T.1. *Transports:* Scottish Aviation Pioneer C.C.1.

NETHERLANDS. The *Koninklijke Nederlandse Luchtmacht*, or Royal Netherlands Air Force, is a self-sufficient arm comprising three commands plus the necessary ancillary services. The Air Defence Command, responsible for the air defence of the Netherlands, possesses six day interceptor squadrons

Pioneers of the Sultan of Muscat's Own Air Force

A Fokker F.27 Friendship of the Netherlands No. 334 Squadron

(Nos. 322 to 327 inclusive) equipped with Hunter F.6s, and three all-weather interceptor squadrons (Nos. 700, 701 and 702) equipped with the F-86K Sabre, and the Tactical Air Command possesses six fighter-bomber squadrons (Nos. 311 to 316 inclusive) equipped with F-84F Thunderstreaks, and one reconnaissance-fighter squadron (No. 306) equipped with the RF-84F and RT-33A. The Training Command's principal bases are Gilze-Rijen and Woensdrecht, and embodies the Air Force Regiment. There is a large Technical Service comprising Signals and Supplies under the direct command of the Air Staff. The other units of the *Luchtmacht* include a Surface-to-Air Missile Group which, comprising two squadrons equipped with the Nike-Ajax and based in Germany, attained operational status late in 1960; a second Group working up with Nike-Hercules missiles, and a third in process of formation with the Raytheon Hawk; one transport squadron (No. 334) with nine Fokker Troopships and three Fokker Friendships, and three light aircraft squadrons (Nos. 298, 299 and 300) operated and maintained by the *Luchtmacht* but coming under the operational command of the Netherlands Army.

An S2F-1 Tracker of the Royal Netherlands Naval Air Service

All Hunter and Sabre squadrons are in process of equipping with the Sidewinder air-to-air missile, but all operational squadrons of the *Luchtmacht* will eventually standardise on the multi-purpose F-104G Super Starfighter, 120 of which will be procured under present plans, re-equipment being scheduled to commence in mid-1962. It is anticipated, however, that a further hundred F-104Gs will be required. The original plan was to equip ten squadrons with the F-104G, 295 aircraft being procured. This requirement was later reduced to 218 aircraft, but current orders are sufficient for the equipment of only five squadrons. A number of *Luchtmacht* Hunter F.4s were shipped to New Guinea late in 1960 to strengthen Dutch defences in the area. In recent years, the *Luchtmacht* has received 201 Hunter F.4s and F.6s, fifty-six F-86K Sabres, 175 F-84F Thunderstreaks, twenty-five RF-84F Thunderflashes, forty T-33As, three RT-33As, sixty-four L-18 and L-21 Super Cubs, and twenty Douglas C-47s, much of this equipment being acquired under M.D.A.P.

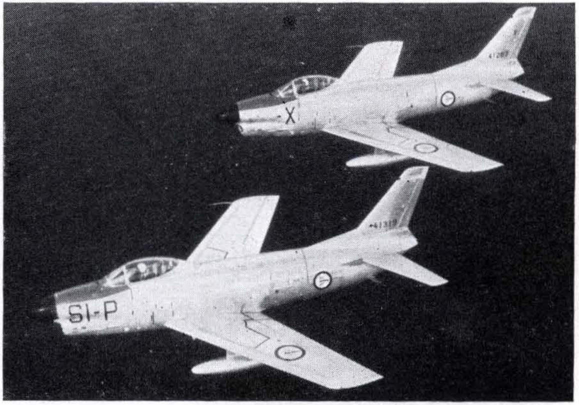
From August 1961, *Luchtmacht* fighter pilots will undergo basic training on Magisters in Belgium at the Bursthem Air Force Base, near Hasselt.

Fighters: North American F-86K Sabre, Hawker Hunter F.4 and F.6. *Fighter-bombers:* Republic F-84F Thunderstreak. *Reconnaissance Fighters:* Republic RF-84F Thunderflash, Lockheed RT-33A. *Helicopters:* Hiller H-23, Sud-Aviation SE-3130 Alouette II. *Transports:* Douglas C-47, Fokker F.27M Troopship, Fokker F.27 Friendship. *Trainers:* Fokker S.14 Mach Trainer, Fokker S.11 Instructor, Potez Air-Fouga Magister, North American T-6 Texan, Hawker Hunter T.7, Lockheed T-33A, Gloster Meteor T.7. *A.O.P. and Liaison:* Piper L-18 and L-21 Super Cub, de Havilland DHC-2 Beaver.

The Royal Netherlands Naval Air Service has two air groups each comprising one squadron of Sea Hawk Mk. 50 strike fighters and one squadron of Tracker anti-submarine aircraft. One air group is normally based aboard the Navy's sole carrier, H.Neth.M.S. *Karel Doorman* while the other is based at Valkenburg. The Sea Hawk-equipped squadrons are Nos. 860 and 3, the latter also having a number of ex-*Luchtmacht* Meteor T.7s for training purposes, and the Tracker-equipped squadrons are Nos. 2 and 4. No. 2 Squadron also possesses a flight of HO4S-3 helicopters which is normally embarked aboard the *Karel Doorman*. A third Tracker squadron, No. 320, was, until early in 1960, equipped with the P2V-5 Neptune maritime reconnaissance aircraft, but these were transferred to the Portuguese Air Force. The R.Neth.N.A.S. has received twenty-six Grumman S2F-1 Trackers and seventeen Canadian-built CS2F-1 Trackers, the latter being presented to the Netherlands as a gift. The CS2F-1s equip No. 1 Squadron which is based at the Dr. Albert Plesman Airport, Curaçao, in the Caribbean. Another R.Neth.N.A.S. unit based overseas is No. 321 Squadron in New Guinea. This squadron operated Martin PBM-5A Mariners until these were grounded early in 1960 as a result of five fatal accidents, and subsequently operated four ex-*Luchtmacht* C-47s and Firefly Mks. 4 and 5, but is now in process of receiving fifteen P2V-7 Neptunes. The remaining R.Neth.N.A.S. units are No. 5 Squadron at Valkenburg which is a training unit with Beech SNB-5s and Trackers, No. 8 Squadron also at Valkenburg with Sikorsky HSS-1N helicopters, and No. 9 Squadron at De Kooy, near Den Helder, with ex-*Luchtmacht* S-11 Instructors. Like the *Luchtmacht*, the R.Neth.N.A.S. has received substantial aid under the M.D.A.P. in recent years, and apart from the Trackers, has acquired six Beech SNB-5s, seventeen Martin PBM-5A Mariners, twenty-two Sea Hawks, three Sikorsky HO4S-3 and five HSS-1N helicopters, and some fifty TBM-3S and -3W Avengers.

Fighters: Hawker Sea Hawk Mk. 50. *Anti-submarine:* Grumman S2F-1 and CS2F-1 Tracker. *Maritime Reconnaissance:* Lockheed P2V-7 Neptune. *Helicopters:* Sikorsky HO4S-3, Sikorsky HSS-1N. *Trainers:* Beech SNB-5, Fokker S-11 Instructor, Gloster Meteor T.7. *Miscellaneous:* Fairey Firefly Mks. 4 and 5, Douglas C-47, Grumman TBM-3S and -3W.

NEW ZEALAND. The Royal New Zealand Air Force's primary rôle is the defence of New Zealand and her island and trust territories, but it also deploys forces overseas, and at the present time has two light bomber squadrons, one maritime reconnaissance squadron, two transport squadrons and one communications squadron. No. 75 Squadron operates Canberra B.2s in Malaya, and No. 14 Squadron began to re-equip with the Canberra B.(I).12 in 1960, eleven aircraft of this type being obtained from the U.K., together with two Canberra T.13s for use at the Bomber Operations Conversion Unit at Ohakea. No. 40 Squadron operates four Hastings C 3 transports for the long-range transportation rôle, and these are currently being replaced by three ex-TEAL Douglas DC-6Bs. No. 41 Squadron is the Transport Support Unit which operates the Type 170 Mk. 31M, twelve of which were purchased by New Zealand, and No. 42 Squadron is the communications unit, including among its equipment the C-47, the de Havilland Devon, the Harvard T.3, and a target-tug conversion of the Grumman TBF-1 Avenger. No. 5 Squadron has operated Short Sunderland M.R.5s for a number of years in the maritime reconnaissance rôle, but these are scheduled to be replaced by six Martin P5M Marlin flying boats. Flying training in the R.N.Z.A.F. is co-ordinated by the Flying Training Wing Headquarters at Wigram where the Initial and Central Flying, and Air Navigation and Air Signals schools are situated. Personnel strength is approximately 4,500 officers and men.


F-86K Sabres of the Kgl. Norske Flyvåpen's No. 337 Squadron

Bombers: English Electric Canberra B.2 and B.(I).12. *Transports:* Handley Page Hastings C.3, Bristol 170 Mk. 31M, Douglas C-47, de Havilland Devon C.1, Douglas DC-6B. *Maritime Reconnaissance:* Short Sunderland M.R.5. *Trainers:*

English Electric Canberra T.13, de Havilland Vampire T.11, North American Harvard T.3. *Target-tugs:* Grumman TBF-1 Avenger. *Miscellaneous:* Auster A.O.P.6, de Havilland Vampire F.B.6.

NICARAGUA. The *Fuerza Aérea de Nicaragua* is a small air arm equipped entirely with obsolete American equipment. The operational strength ostensibly comprises one fighter squadron equipped with the F-51D Mustang and one fighter-bomber squadron equipped with the F-47D Thunderbolt, but these units are reportedly under strength, and there is little likelihood of modern equipment being acquired in the foreseeable future. The *Fuerza Aérea* operates small transport elements and a flying school.

Fighters: North American F-51D Mustang. *Fighter-bombers:* Republic F-47D Thunderbolt. *Trainers:* Boeing-Stearman PT-13A Kaydet, North American T-6 Texan, Fairchild PT-19. *Transports:* Douglas C-47, Beech C-45.

NORWAY. Norway, with Denmark, forms the Northern Command of N.A.T.O., and is divided into two *Luftkommandos*, or Air Commands—*Luftkommando Trøndelag* and *Luftkommando Nord-Norge*—each with its own headquarters and operational control owing to Norway's exceptionally rugged and mountainous terrain and the relatively poor communications between North and South. The *Kgl. Norske Flyvåpen*, or Royal Norwegian Air Force, has a statutory personnel strength of 11,929, including 3,692 civilians, and apart from one reconnaissance-fighter squadron, its operational strength consists solely of day fighter and all-weather fighter squadrons. At the present time, the *Flyvåpen* has eight fighter squadrons, Nos. 330, 331, 332, 336, and 338 equipped with Canadair Sabre Mk. 4s, and Nos. 334, 337 and 339 equipped with F-86K Sabres. In addition, No. 717 Squadron is equipped with the RF-84F Thunderflash. Maritime reconnaissance and air/sea rescue are undertaken by No. 333 Squadron which is in process of converting from the PBY-5A amphibian to the SA-16B Albatross, and there is one transport unit, No. 335 Squadron, equipped with the C-119F and G and the C-47.

The training organisation includes No. 718 Squadron, the Operational Training Unit, equipped with the Lockheed T-33A, but Norwegian pilots are trained in Canada after a fourteen–fifteen hour grading course in Norway on the SAAB-91B-2 Safir. Thirty Norwegian pilots and three navigators are trained in Canada each year as part of that country's contribution to N.A.T.O., and the present agreement with the Canadian External Affairs Department extends until 1963. Each of the four principal *Flyvåpen* bases in the *Luftkommando-Aircommand* has a flight of helicopters for rescue duties, these flights comprising one Sikorsky H-19D and two or three Agusta-Bell 47G or 47J helicopters. These bases also each operate a communications flight equipped with the Norseman, the Otter or the SAAB-91B-2 Safir. A number of light aircraft are operated in the A.O.P. rôle by the Norwegian Army, these being flown by Army pilots but maintained by the *Flyvåpen*. Piper L-18C Super Cubs have served in the A.O.P. rôle for several years, but late in 1960 the first two L-19A Bird Dogs were received to supplement and eventually supplant the Super Cubs.

The *Flyvåpen* is to receive the F-104G Super Starfighter strike fighter under the Mutual Aid Programme, but it is improbable that any aircraft of this type will enter service in Norway before mid-1962.

Fighters: North American F-86K Sabre, Canadair CL-13 Sabre Mk. 4. *Reconnaissance Fighters:* Republic RF-84F Thunderflash. *Transports:* Douglas C-47, Fairchild C-119F and C-119G. *Helicopters:* Sikorsky H-19D, Agusta-Bell 47G and 47J. *Communications:* SAAB-91B-2 Safir, de Havilland DHC-3 Otter, C.C.F. Norseman. *Rescue:* Grumman SA-16B Albatross. *Trainers:* Lockheed T-33A, SAAB-91B-2 Safir. *A.O.P.:* Piper L-18C Super Cub, Cessna L-19A Bird Dog.

PAKISTAN. Although not large, the Pakistan Air Force is a modern and efficient force organised into two Groups: No. 1 (Peshawar) controlling all operational and flying units, and No. 2 (Drigh Road) controlling maintenance and ground organisations. The P.A.F. was solely a defensive force until the arrival of some twenty-five Martin B-57B tactical light bombers in 1960. The P.A.F. possesses two fighter wings equipped with the F-86F Sabre, and one squadron of Fury F.B.60 fighter-bombers. There are three transport squadrons equipped principally with the Type 170, the P.A.F. having acquired one Mk. 21E, thirty-four Mk. 21Ms, seven Mk. 31Es and thirty-one Mk. 31Ms, and one of these squadrons also serves as the Transport Conversion Unit, and another includes the President's Flight of a Viscount 734, a Wayfarer and a Viking. The principal P.A.F. bases are Mauripur, Drigh Road, Peshawar, Kohat, Lahore, Risalpur and Sargodha, and the total personnel strength is some 15,000 officers and men.

Fighters: North American F-86F Sabre. *Fighter-bombers:* Hawker Fury F.B.60. *Reconnaissance-fighters:* Lockheed RT-33A. *Bombers:* Martin B-57B. *Transports:* Bristol

Type 170 Mk. 21M and Mk. 31E and M, de Havilland Devon, Vickers Viscount 734, Vickers Viking. *Helicopters:* Sikorsky H-19A. *A.O.P.:* Auster A.O.P.6. *Liaison:* Auster Aiglet Trainer. *Target-tug:* Hawker Fury T.T.60. *Trainers:* Lockheed T-33A, North American T-6G Texan, Hawker Fury T. 61, Martin B-57C. *Rescue:* Grumman SA-16A Albatross.

PARAGUAY. The *Fuerza Aérea del Paraguay* (Paraguayan Air Force) is limited to a small number of transports, trainers and light aircraft and possesses no operational element, and in view of the turbulent internal situation and poor economic position of Paraguay, the *Fuerza Aérea* is unlikely to receive new equipment in the foreseeable future. During desultory fighting between government forces and factions opposed to the régime of General Alfredo Stroessner in April 1959, the trainers and light aircraft of the *Fuerza Aérea* were used for reconnaissance and light bombing missions.

Transports: Douglas C-47, Beech C-45. *A.O.P.:* Piper L-4A. *Trainers:* Fairchild M-62, Boeing-Stearman PT-17 Kaydet, North American T-6 Texan.

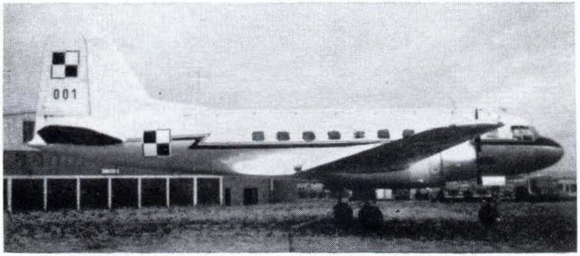
PERU. The *Fuerza Aérea del Perú* (Peruvian Air Force) is one of the best equipped and most efficient of Latin American air arms, and possesses three combat groups (each roughly equivalent to an R.A.F. wing). These are *Gruppo* 12 with one squadron of F-86F Sabres, one squadron of Hunter Mk. 52s and one squadron of Lockheed F-80Cs; *Gruppo* 13 with one squadron of Lockheed F-80Cs and two squadrons of F-47D Thunderbolts, and *Gruppo* 21 with one squadron of Canberra B.(I).8s, one squadron of B-26C Invaders, and one squadron of B-25J Mitchells. *Gruppo* 41, also known as the *Transportes Aéreos Militares* (T.A.M.), provides transport support, and undertakes some commercial flights in addition to its normal military activities. Early in 1961, the Peruvian government decided to purchase three Lockheed C-130 Hercules transports. There is one air/sea rescue squadron, a maritime reconnaissance squadron, and a number of training schools. The principal bases are Las Palmas, Talara, Chiclayo, Iquitos and Ancón. The F.A.P. is the first Latin American air arm to initiate all-jet training, and received the first of fifteen Cessna T-37Bs in February 1961.

Fighters: Hawker Hunter Mk. 52, North American F-86F Sabre. *Fighter-bombers:* Lockheed F-80C Shooting Star, Republic F-47D Thunderbolt. *Bombers:* North American B-25J Mitchell, Douglas B-26C Invader, English Electric Canberra B.(I).8. *Maritime Reconnaissance:* Lockheed PV-2 Harpoon. *Transports:* Douglas C-47, Curtiss C-46F, Beech C-45, de Havilland DHC-2 Beaver. *Helicopters:* Hiller UH-12B, Sud-Aviation SE-3130 Alouette II. *Rescue:* Grumman G-21 Goose, Convair PBY-5A. *Trainers:* Cessna T-37B, Hawker Hunter T.62, Lockheed T-33A, Boeing-Stearman PT-17 Kaydet, North American T-6 Texan, Beech T-11B Kansan, Fairchild PT-26. *Miscellaneous:* Douglas DB-8A-3P, Beech D17S.

A Douglas C-47 Transport of the Philippine Air Force

PHILIPPINES. The Philippine Air Force possesses one operational wing comprising three squadrons of F-86F Sabre fighter-bombers, and one all-weather squadron with eighteen F-86D Sabres. There are also small transport, liaison, A.O.P. and rescue elements, and flying training schools which provide primary, basic and advanced training. Training units replaced the Boeing-Stearman PT-17 Kaydets with thirty-six Fuji-built Mentor trainers during 1959–60, and also received a number of ex-U.S.A.F. T-28A basic trainers to

An Avia-built Il-14M of the Polskie Lotnictwo Wosjkowe

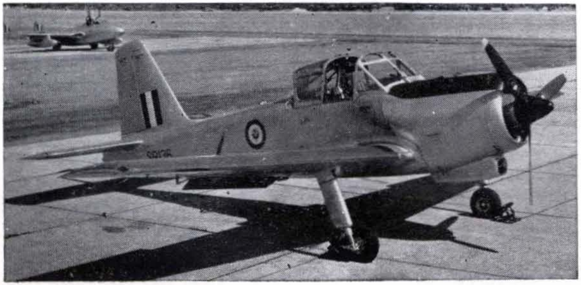


A Forca Aérea Portuguesa Air/Sea Rescue Service Sikorsky H-19A

supplement the T-6 Texans and BT-13 Valiants. The Phil.A.F. has a requirement for six liaison aircraft, and was considering both the Dornier Do 27 and the Fuji KM-1 late in 1960. One Fokker Friendship has been obtained for use as a V.I.P. transport. The Philippine Air Force is currently considering a replacement for the Sabre and the F-102A Delta Dagger is understood to be favoured. However, the availability of Mutual Defence Assistance Pact funds will be a major factor in any equipment change.

Fighter-bombers: North American F-86F Sabre. *Transports:* Douglas C-47, Fokker F.27 Friendship, Aero Commander. *Helicopters:* Sikorsky H-19A. *Rescue:* Grumman SA-16A Albatross. *Trainers:* North American T-28A, Fuji-Beech T-34 Mentor, Lockheed T-33A, North American T-6 Texan, Vultee BT-13A Valiant. *Liaison:* Cessna 310, Convair-Stinson L-5.

A Hunting Provost T.53 of the Royal Rhodesian Air Force



POLAND. The *Polskie Lotnictwo Wosjkowe* (Polish Air Force), or P.L.W., is essentially a tactical force, its operational elements equipped exclusively with interceptor fighters, fighter-bombers, and light bombers, most of which are of Soviet design and Polish manufacture. Believed to be the strongest and most efficient of the European " satellite " air arms, it possesses six interceptor fighter and fighter-bomber Divisions with a total of some fifteen *Dyons* (Wings), one Light Bomber Division with three *Dyons*, and there are a number of ground attack *Dyons*. Most first-line interceptor *Dyons* are now equipped with the supersonic MiG-19, but a minority still have the day and all-weather versions of the MiG-17. All light bomber units have the Il-28, and the ground attack formations have the MiG-15. There is also a Naval Co-operation Division believed to be equipped with the MiG-17. The main P.L.W. Supply Depot is situated at Zamosc, in Central Poland, and the P.L.W. utilises some 35–40 operational bases. Apart from the indigenous TS-8 Bies basic trainer, most P.L.W. training equipment is obsolescent, but it is hoped to introduce the TS-11 Iskra basic jet trainer in 1962. The personnel strength of the P.L.W. is approximately 30,000 officers and men.

Fighters: MiG-17 (LIM-5), MiG-19 (LIM-7). *Fighter-bombers:* MiG-15 (LIM-2), MiG-17 (LIM-5). *Bombers:* Il-28. *Transports:* Il-14M, Li-2. *Helicopters:* Mi-1 (SM-1), Mi-4. *Trainers:* TS-8 Bies, MiG-15UTI, Il-28U, Yak-18, Yak-11. LWD Junak 3. *Miscellaneous:* CSS.13, (Po-2), Yak-12M.

PORTUGAL. The *Forca Aérea Portuguesa* (Portuguese Air Force), or F.A.P., is the smallest air arm in N.A.T.O., possessing five operational squadrons of which two, Nos. 10 and 11, are equipped with F-86F Sabre fighter-bombers and Nos. 20 and 21 with F-84G Thunderjets. The remaining operational unit is a maritime reconnaissance squadron equipped with twelve former R.Neth.N.A.S.-P2V-5 Neptunes. There are primary, basic and advanced training units, jet conversion being undertaken at Tancos on T-33As. The Air/Sea Rescue Service operates several SA-16A Albatross amphibians and Sikorsky H-19A helicopters, and the Military Transport Service operates six former U.A.T. Nord N.2502 Noratlases, a small number of C-47 and C-54 transports, and nineteen C-45 Expeditors which were given to the F.A.P. by the R.C.A.F. to replace the service's ancient Avro Anson Is. Six additional Nord N.2502 transports are being purchased, deliveries of these being scheduled for 1962. The total personnel strength of the F.A.P. is 500 officers and 1,984 men, and the principal bases are Cintra, Ota, Tancos and Montijo.

Fighter-bombers: North American F-86F Sabre, Republic F-84G Thunderjet. *Maritime Reconnaissance:* Lockheed P2V-5 Neptune. *Transports:* Nord 2502 Noratlas, Douglas C-54, Douglas C-47, Beech C-45 Expeditor. *Rescue:* Grumman SA-16A Albatross. *Helicopters:* Sud-Aviation SE-3130 Alouette II, Sikorsky H-19A. *Trainers:* Lockheed T-33A, Beech T-11B Kansan, North American T-6 Texan, North American Harvard 3, de Havilland Chipmunk.

RHODESIA. The Royal Rhodesian Air Force currently possesses two operational squadrons, one equipped with Vampire F.B.9 fighter-bombers and the other equipped with Canberra light bombers. There is also a transport squadron which supplemented the four Hunting Pembroke C.1s and six ex-R.A.F. C-47 Dakotas late in 1959 with the purchase of four former B.O.A.C. Canadair Argonauts. Training is undertaken on Provost T.53s and Vampire T.11s, and the Provosts serve as both trainers and close-support aircraft for " police " actions.

Fighter-bombers: De Havilland Vampire F.B.9. *Bombers:* English Electric Canberra B.2. *Transports:* Canadair Argonaut, Douglas C-47, Hunting Pembroke C.1. *Trainers:* Hunting Pembroke T.53, de Havilland Vampire T.11, Avro Anson T.20. *A.O.P.:* Auster A.O.P.6 and A.O.P.7. *Miscellaneous:* North American Harvard.

RUMANIA. The Rumanian Air Force is, like those of the Soviet Union's other Balkan " satellites ", ostensibly independent of the Soviet Air Force, but since the late 'forties its development has been closely supervised by the Soviet Air Force. The strength and equipment of the Rumanian Air Force is believed to have changed little since 1956 when the interceptor elements began to re-equip with the day and all-weather versions of the MiG-17, and current strength reportedly comprises three Fighter Regiments each possessing some seventy MiG-15s and MiG-17s and one Bomber Regiment with about fifty Il-28s. There are small transport and communications units, and personnel strength is 15,000–18,000 officers and men.

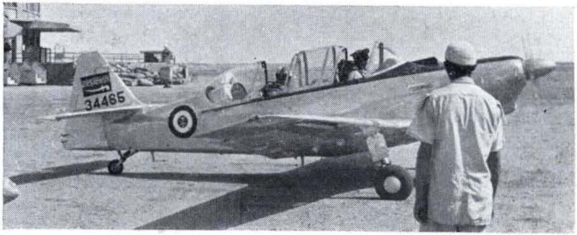
Fighters: MiG-15, MiG-17. *Bombers:* Il-28. *Transports:* Il-14M, Li-2, An-2. *Helicopters:* Mi-4. *Trainers:* Yak-11, Yak-18, MiG-15UTI. *Miscellaneous:* Po-2.

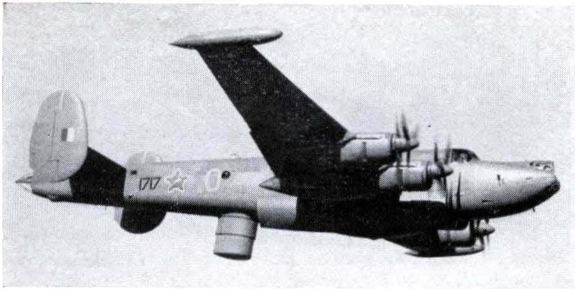
Salvador's sole fighter-bomber flight has F4U-5 Corsairs

SALVADOR. The *Fuerza Aérea Salvadorena* (Salvadorean Air Force), or F.A.S., is a tiny air arm in keeping with the size of the Republic of El Salvador which suffered two revolutions in 1960. The F.A.S. was completely reorganised by a small U.S. Military Air Mission in the late 'forties, and now consists of a Flying Training School at Ilopango which has a few Boeing-Stearman PT-13A Kaydet, AT-11 Kansan and T-6 Texan trainers, and three Beech Mentors which were acquired in 1954; an Engineering School which is responsible for the maintenance and repair of F.A.S. aircraft; a fighter-bomber flight equipped with the F4U-5 Corsair, and a transport flight equipped with the C-47. El Salvador is divided into three defence zones, but the only major air base is that of Ilopango.

Fighter-bombers: Chance Vought F4U-5 Corsair. *Transports:* Douglas C-47. *Trainers:* Beech T-34 Mentor, Beech AT-11 Kansan, Boeing-Stearman PT-13A Kaydet, North American T-6 Texan.

The Royal Saudi Air Force received ten TE-1A Buckaroo trainers

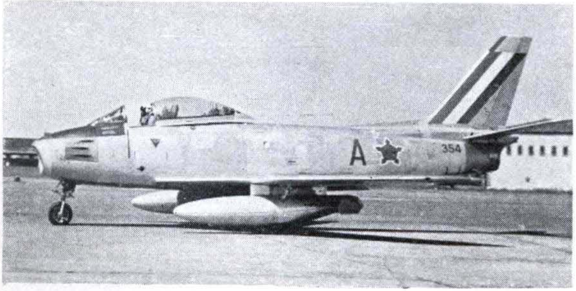




A Shackleton M.R.3 of the Suid-Afrikaanse Lugmag's No. 35 Sqdn.

SAUDI ARABIA. The Royal Saudi Air Force has received considerable assistance from the U.S.A.F. since 1952 when a U.S. training mission and ten Temco TE-1A Buckaroo trainers arrived at Dhahran. Douglas C-47 transports and T-6 Texan basic trainers followed, and in 1955 the first operational Saudi squadron began forming with nine B-26B Invader bombers. A considerable amount of additional equipment has since been obtained, including six C-123B transports, T-33A jet trainers, and F-86F Sabre fighters, and the Royal Saudi Air Force now consists of one Sabre-equipped fighter-bomber squadron, one Invader-equipped light bomber squadron, a transport squadron equipped with the C-47 and the C-123B, training schools, and liaison and communications flights.

The Suid-Afrikaanse Lugmag purchased thirty-four Sabre Mk. 6s



Fighter-bombers: North American F-86F Sabre. *Bombers:* Douglas B-26B Invader. *Transports:* Douglas C-47, Fairchild C-123B Provider. *Helicopters:* Sikorsky S-58, Westland Widgeon. *Trainers:* Lockheed T-33A, North American T-6 Texan, Beech T-34 Mentor, de Havilland Chipmunk T.10, Temco TE-1A Buckaroo, de Havilland Vampire F.B.52. *Miscellaneous:* Vickers Varsity.

SENEGAL. The Senegalese Republic has established a small air arm which is currently being trained by a French mission. Current equipment includes two helicopters of an unspecified type, two C-47 transports and four Broussard utility aircraft.

SINGAPORE. The government of the self-governing State of Singapore has announced its interest in forming a small national air arm. The duties of this air arm will be confined largely to internal policing, but no decision has yet been reached concerning the type of aircraft to be acquired.

SOMALIA. When Italian trusteeship of Somalia terminated, the Italian-controlled *Cuerpo Aeronautica della Somalia* was handed over to the Somali government as the nucleus of a national air arm for internal policing.

Fighter-bombers: North American F-51D Mustang. *Transports:* Beech C-45, Douglas C-47.

SOUTH AFRICA. The *Suid-Afrikaanse Lugmag* (South African Air Force) has obtained little new aircraft since 1957, apart from seven SE-3130 Alouette II helicopters. The principal operational squadrons are Nos. 1 and 2 Squadrons equipped with CL-13B Sabre Mk. 6s, thirty-four of which were purchased from Canada in 1956, and Nos. 235 and 237 Squadrons equipped with Vampire F.B.5s, some seventy Vampire F.B.5s and T.55s having been acquired from 1952 onwards. These squadrons, together with the Active Citizen Force squadrons, also equipped with Vampires, come under No. 1 (Flying Training and Tactical) Group. No. 2 (Maritime) Group includes No. 35 Squadron with eight Shackletons obtained late in 1957, and Nos. 17 and 22 Squadrons equipped with PV-1 Venturas which are used for a variety of rôles ranging from target-towing and photographic missions to V.I.P. transport. The *Suid-Afrikaanse Lugmag* College and Central Flying School are situated at Dunnottar, and other stations include the Technical Training School at Lyttelton, the Maintenance Bases at Zwartkop and Voortrekkerhoogte, and the Operational Training School at Langebaanweg. Apart from a substantial number of C-47s, the transport elements have received nine Devons, two Herons and a Viscount 781. Several Alouette III helicopters are on order.

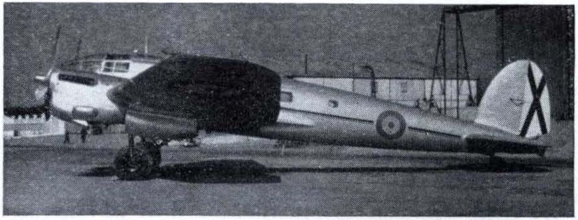
Fighters: Canadair CL-13B Sabre Mk. 6. *Fighter-bombers:* De Havilland Vampire F.B.5. *Maritime Reconnaissance:* Avro Shackleton M.R.3, Lockheed PV-1 Ventura. *Transports:* Douglas C-47, de Havilland Dove, de Havilland Heron, Lockheed PV-1 Ventura, Vickers Viscount 781. *Helicopters:* Sud-Aviation SE-3130 Alouette II, Sikorsky S.51, Sikorsky S.55. *A.O.P.:* Dornier Do 27B, Auster A.O.P. 5, 6, 7, and 9. *Trainers:* North American Harvard Mks. 2, 3, and 4, de Havilland Vampire T.55.

SOVIET UNION. The *Voenno-Vozdushnye Sily* (Military Aviation Forces) comprise together what is numerically the largest air arm in the world. The principal components of this force are the *Istrebitelnya Aviatsiia Protivovozdushnoi Oborony* (I.A.-P.V.O.), or Fighter Air Armies of the Air Defence Forces, which, possessing approximately one-fifth of Russia's first-line operational aircraft, embrace every component of the active air defence system, including conventional anti-aircraft artillery, surface-to-air missiles, the early warning systems, and the interceptor fighters; the *Dalnaya Aviatsiya* (D.A.), or Long-range Aviation, which provides Russia's strategic bombing forces; the *Frontovaia Aviatsiya* (F.A.), or Frontal Aviation, which, possessing approximately three-fifths of Russia's first-line aircraft strength, is the tactical element for the direct support of the Soviet armies and the protection of Russia's frontiers, and the *Aviatsiya-Voenno Morskikh Flota* (A.-V.M.F.), or Naval Air Fleet, a shore-based force for the direct support of the Soviet Navy.

The I.A.-P.V.O. has headquarters in Moscow which exercise overall command, and subordinate to these are the P.V.O. Defence District Headquarters to which the I.A.-P.V.O. forces are assigned according to the relative importance of the area protected by the Defence District. These Districts include Moscow, Stalingrad, Baku, Kiev, Gorki, Leningrad, Kharkov, and Khabarovsk. The I.A.-P.V.O. forces are divided into Air Divisions each of which has a statutory strength of three Air Regiments of thirty-seven aircraft divided into three squadrons.

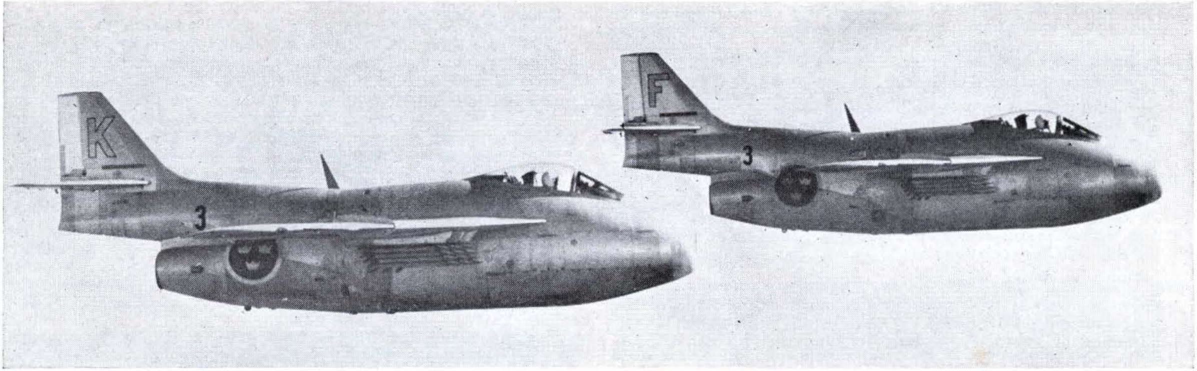
The D.A., which is Russia's equivalent of the U.S.A.F.'s Strategic Air Command, consists of long-range medium and heavy bombers, aerial refuelling tankers and supporting transport. The D.A. is not believed to possess more than 1,500 first-line operational bombers, and its major formation is the Air Army of which there are three in addition to an Independent Air Corps. The D.A. Headquarters are situated in Moscow, and the so-called Long-Range Air Armies are subdivided into Air Corps and Air Divisions, each Corps having two or three Divisions which are further sub-divided into three Air Regiments of three squadrons each with a normal statutory strength of ten aircraft. The Air Armies have no fixed statutory strength, and two are based in the Moscow, Carpathian and Kiev areas, each with some 550–600 bombers, while the third is based in the Far East with some 300–350 aircraft.

The F.A.'s largest formation is the Frontal Air Army which, under the direct control of the local Army commander, has no fixed establishment, varying in size with the importance attached to the particular Air Army Districts. There are at least twelve Frontal Air Armies, each divided into several Air Corps, but those based in the interior regions of the Soviet Union containing only token forces. An F.A. Air Corps normally has three Air Divisions of three Air Regiments, a Fighter Regiment possessing thirty-seven aircraft and a Bomber Regiment having thirty-two. F.A. interceptors are responsible for defending the zone which surrounds the whole of the Soviet Union and through which aircraft are allowed to pass only in controlled corridors.



Fifteen C.A.S.A.2111s serve as T.8 transports in Spanish A.F.

The A.-V.M.F. is, in general, equipped with the same aircraft types as the other arms of the V.V.S., and are all shore-based, the Soviet Navy possessing no aircraft carriers. The A.-V.M.F. is distributed between the five Soviet Fleets, and the largest A.-V.M.F. component is believed to be that attached to the Pacific Fleet which controls about one-third of the A.-V.M.F.'s total operational aircraft. Each Fleet Air Force operates under the control of the individual Fleet commanders,



SAAB-29F (J 29F) fighters of Flottiljer 3 of the Flygvapnet's Eskader 3 which has headquarters in Stockholm

and the largest operational echelon in the A.-V.M.F. is the Air Division which comprises three Air Regiments.

The V.V.S. possess one other major component, the *Aviatsiya-Vozdushnye Dessentnich Vosk* (A.-V.D.V.), or Aviation of the Airborne Troops. Self-sufficient, the A.-V.D.V. has several Airborne Troop Divisions each of which comprises five Regiments of medium and long-range transports and assault transports and helicopters. For a list of current Russian operational and ancillary aircraft, the *Guide to Soviet Aircraft* (pages 77–88) should be consulted.

SPAIN. The *Ejército del Aire*, Spain's " Air Army ", has been extensively reorganised and re-equipped since the signing of the Spanish-American Defence Treaty in September 1953, and the backbone of the air arm is now provided by five day fighter wings each comprising three squadrons of twenty-five aircraft and equipped with the F-86F Sabre. The *Ejército del Aire* is divided into the *Aviación de Defensa Aérea* (Air Defence Aviation), the *Aviación Tactica* (Tactical Aviation), and the *Aviación de Transporte* (Transport Aviation). The *Aviación de Defensa Aérea*, the control centre of which is at Torrejón de Ardoz, comprises the five day interceptor wings, certain U.S.A.F. fighter elements, the anti-aircraft artillery, and the Aircraft Control Warning Stations which are manned by both Spanish and U.S. personnel. A number of totally obsolete types, such as the HA-1112-M1L Buchon fighter (derived from the Bf 109G) which equips two fighter-bomber wings, and the C.A.S.A.2.111-D bomber (derived from the He 111H) which equips three light bomber wings, primarily remain in service in Spain's overseas possessions, such as Rio de Oro on the west coast of Africa. The *Escuela de Reacción* (Jet School) at Talavera la Real, Badajoz, employs T-33As and F-86F Sabres, and is expected to receive the indigenous HA-200-R1 Saeta jet trainer, and the principal basic trainer is the T-6G Texan, 120 of which were passed to Spain, these being supplemented by the nationally-designed HA-100E-1 Triana. The two transport wings originally received fifteen C-47s but operate a variety of obsolete types alongside these, including the C.A.S.A.352-L (Ju 52/3M) and fifteen transport conversions of the C.A.S.A.2.111 bomber. For A.O.P. and communications duties, fifty Do 27s are being delivered by C.A.S.A., the first machines having been completed in 1960, and the air/sea rescue elements operate SA-16A Albatross amphibians and Sikorsky H-19 and Bell Model 47G helicopters.

Fighters: North American F-86F Sabre. *Fighter-bombers:* Hispano HA-1112-M1L Buchon. *Transports:* Douglas C-47, C.A.S.A.352-L, C.A.S.A.2.111, C.A.S.A.201-B Alcotan, C.A.S.A.202 Halcón, C.A.S.A.207 Azor. *Bombers:* C.A.S.A.

2.111-B. *Trainers:* C.A.S.A.2.111-F, Lockheed T-33A, North American T-6G Texan, Hispano HA-100E-1 Triana, Hispano HA-200-R1 Saeta, A.I.S.A. I-115, Beech T-34 Mentor. *A.O.P. and Liaison:* C.A.S.A.-Dornier Do 27B, A.I.S.A. I-11B, Fieseler Fi 156C Storch, Stinson 108 Voyager. *Rescue:* Grumman SA-16A Albatross. *Helicopters:* Sikorsky H-19, Bell 47G.

SUDAN. The Sudanese Air Force is a small organisation concerned entirely with internal policing, training and communications rôles, and current equipment comprises seven Provost T.53s, three Gomhourias, and two Pembroke C.55s. Some Sudanese pilots have been trained in the United Arab Republic and Ethiopia, and others have been trained by the R.A.F., the latter being the first Sudanese Air Force personnel to gain jet experience. There is also a training school at Khartoum for which four Hunting Jet Provosts are to be delivered in 1961. Although, in 1957, the Sudanese government considered the purchase of four Hawker Sea Furies, the Sudanese Air Force currently possesses no combat aircraft.

Transports: Hunting Pembroke C.55. *Trainers:* Hunting Provost T.53, G.T.A.F. Gomhouria.

SWEDEN. The *Kungl. Svenska Flygvapnet* (Royal Swedish Air Force) is, despite Sweden's small population, one of the most efficient and modern of the world's air arms. Sweden has a length exceeding that of the entire continental front from northern Denmark to the Mediterranean coast, and the *Flygvapnet*, currently the fifth largest of the world's air forces in operational aircraft strength, is essentially a defensive force, and is engaged in a re-equipment programme coupled with the introduction of a semi-automatic early warning and operational control scheme which, known as STRIL 60, links the interceptors with the Bristol/Ferranti Bloodhound and Raytheon Hawk surface-to-air missile batteries and anti-aircraft artillery. The *Flygvapnet* has a current strength of twenty-four day fighter, six all-weather fighter, twelve all-weather attack and five

SAAB-35A (J 35A) Draken interceptors of Flottiljer 13, the first wing to re-equip with this supersonic warplane

A Do 27 light utility transport of the Schweizerische Flugwaffe

photographic and radar reconnaissance squadrons. A *Flygvapnet* squadron normally consists of 12–15 aircraft plus reserves, and first-line operational strength is thus 570–700 aircraft. The total peacetime personnel strength is 20,300 officers and men.

The *Flygvapnet* is organised in four Eskaders, or Groups, to each of which a number of *Flottiljer*, or Wings, are assigned, each Wing normally comprising three squadrons. *Eskader* 1 with headquarters in Gothenburg is the attack force equipped with the A 32A Lansen and comprising F 6, F 7, and F 17; *Eskader* 2 with headquarters at Ängelholm comprises day and night fighter groups F 9 (J 29F), F 10 (J 29F) and F 12 (J 32B); *Eskader* 3 with headquarters in Stockholm consists of one night fighter wing, F 1 (J 32B) and five day fighter wings, F 3 (J 29F), F 8 (Hunter), F 13 (J 35A), F 16 (J 29F, in process of converting to the J 35) and F 18 (Hunter), and *Eskader* 4 with headquarters at Luleå has one reconnaissance wing, F 11 (S 29C and S 32C), a mixed reconnaissance and all-weather fighter wing, F 21 (S 29C, S 32C and J 32B), and two day fighter wings, F 4 (J 29F) and F 15 (J 29F). A slight reduction in the number of fighter squadrons is planned in connection with the conversion to more costly aircraft and the introduction of surface-to-air missiles, and the *Flygvapnet* is currently re-equipping its interceptor units with the supersonic J 35A and B Draken, and all fighter wings will be operating the Draken by the mid 'sixties, giving the *Flygvapnet* an all-supersonic all-weather interceptor force. The reconnaissance squadrons will re-equip with a variant of the Draken, the S 35B.

The Flying Training School at Ljungbyhed (F 5) is one of

Pilatus P.3 basic trainers of the Schweizerische Flugwaffe at Sion. Fifty-six P.3s were delivered, entering service in 1956

the largest establishments of its kind in the world, and is equipped with the SAAB-91B and -91C which carry the pupil pilot to the Vampire T.55. The training organisation also includes a conversion training school for the Draken using two-seat J 35Cs, and the *Flygkadettskolan* (Flying Cadet School) at Uppsala (F 20) equipped with J 29s. During 1959–60, the *Flygvapnet* received its first helicopters in the form of three Alouette IIs, and additional helicopters are shortly to be procured, primarily for rescue purposes. The largest military helicopter operator in Sweden, however, is currently the Navy which received its first helicopters in 1958 when four Vertol 44 helicopters were obtained for anti-submarine duties, and these were followed in 1959–60 by twelve SAAB-assembled Alouette IIs, these equipping the two current naval helicopter squadrons. An order has been placed for twenty Boeing-Vertol 107-II helicopters, deliveries of which are anticipated during early 1962, and it is planned to establish two more naval helicopter squadrons. The Swedish Army is also establishing helicopter units, and twelve SAAB-assembled Alouette IIs were delivered to these during 1959–60. Substantial helicopter procurement is foreseen for the Swedish Army in the coming years. Of the total Swedish defence budget for the 1960–61 Fiscal Year, some forty per cent is devoted to the *Flygvapnet*, and of this approximately seventy per cent is being spent on the procurement of aircraft, radar stations, airborne missiles, simulators, electronic equipment, etc.

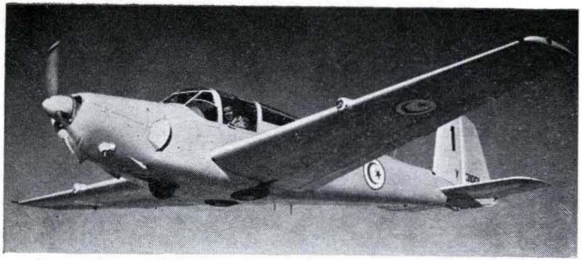
Fighters: SAAB-35A and B Draken (J 35A and B), SAAB-32B Lansen (J 32B), Hawker Hunter Mk. 50 (J 34), SAAB-29F (J 29F). *Attack:* SAAB-32A Lansen (A 32A). *Reconnaissance:* SAAB-32C Lansen (S 32C), SAAB-29C (S 29C), Piper Super Cub (S 51). *Helicopters:* Sud-Aviation SE-3130 Alouette II (HKP-2), Vertol 44 (HKP-1). *Transports:* Douglas C-47 (Tp 79), C.C.F. Norseman (Tp 78), Beech C-45 (Tp 45), de Havilland Dove (Tp 46), Hunting Pembroke C.52 (Tp 83). *Trainers:* SAAB-35C (J 35C), de Havilland Vampire T.55 (J 28C), de Havilland Vampire F.B.50 (J 28B), SAAB-91B and -91C (Sk 50). *Miscellaneous:* English Electric Canberra B.2 (Tp 52), North American T-6 (Sk 16), Vickers Varsity (Tp 82), Grumman Goose (Tp 81).

SWITZERLAND. The *Schweizerische Flugwaffe*, or Swiss Air Force, will, if current proposals are carried out, become a smaller and more versatile arm over the next few years. Since the end of World War II it has been Swiss practice to maintain a combat force of 400 aircraft by purchases of about 100 new warplanes every few years. However, owing to the great cost of modern combat aircraft, the first-line strength is expected to be reduced to 200–250 aircraft virtually all of which will be multi-purpose fighters, and the last combat type to be purchased for the *Flugwaffe* was the Hunter Mk. 58. Of the 100 Hunter Mk. 58s ordered, deliveries of which commenced in 1958, the last eighty-eight machines were completed to Hunter F.G.A.9 standards and are therefore suitable for both the interception and ground attack rôles. At the end of 1960, the *Flugwaffe* selected the G.A.M. Dassault Mirage III multi-purpose fighter for 1962–3 delivery, as a Vampire replacement. One hundred Mirage aircraft are to be built in Switzerland.

The largest formation in the *Flugwaffe* is the *Flieger-Regiment* of which there are three, these being divided into *Geschwader* (Wings) comprising from two to four *Staffeln* (Squadrons) of which there are some twenty-four in the current first-line strength. These *Staffeln* are equipped primarily with the Hunter Mk. 58 and the de Havilland Venom F.B.50, 250 of the latter having been built under licence in Switzerland. The principal types operated by the Flying Training School are the Pilatus P.3 basic trainer and the Vampire T.55 from which pupils convert direct to the Hunter or Venom. Three Beech Twin Bonanzas and seven Do 27s are employed as light utility transports, and there are a number of helicopters for communications and mountain rescue. The main *Flugwaffe* bases include Dubendorf, Emmen, Payerne, Sion, and Magadine.

An F-84G Thunderjet of a Royal Thai Air Force combat wing

Fighter-bombers: Hawker Hunter Mk. 58, de Havilland Venom F.B.50, de Havilland Vampire F.B.6. *Trainers:* Pilatus P.3, de Havilland Vampire T.55, Pilatus P.2, North American T-6 Texan. *Helicopters:* Sud-Aviation SE-3130 Alouette II, Sud-Aviation SO-1221 Djinn. *Communications*

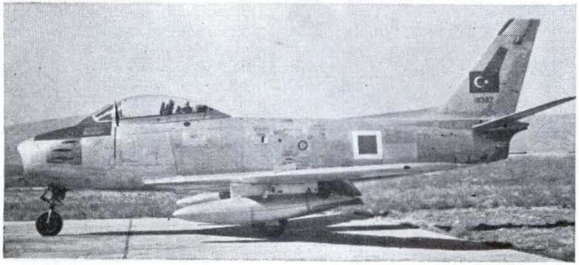


One of fifteen SAAB-91Ds of the Armée de l'Air Tunisienne

and Liaison: Beech Twin Bonanza, Dornier Do 27A, Messerschmitt Bf 108 Taifun, Fieseler Fi 156C Storch, Bücker Bü 181 Bestmann. *Target-tugs:* C-3603.

THAILAND. The Royal Thai Air Force has received substantial assistance in its development from the U.S.A., and possesses some three combat wings, one of which is equipped with the F-86F Sabre fighter, a number of which were received in 1960, and another with the F-84G Thunderjet fighter-bomber. The other combat wing is equipped principally with the Grumman F8F-1D Bearcat, but a number of T-6 Texans are fitted with underwing gun pods and rocket rails for close-support duties, and RT-33As are used for reconnaissance. Training is supervised by U.S. advisers, basic training being given on the T-6 Texan, 138 of which have been received by Thailand, from which pupils convert to the Bearcat or T-33A. There are a number of liaison, communications and A.O.P. flights equipped with various types of light aircraft and helicopters, and the transport element has received ten C-47s and a few C-45s and C-54s.

Turkish Canadair Sabre Mk. 2 (brought up to Mk. 4 standards)



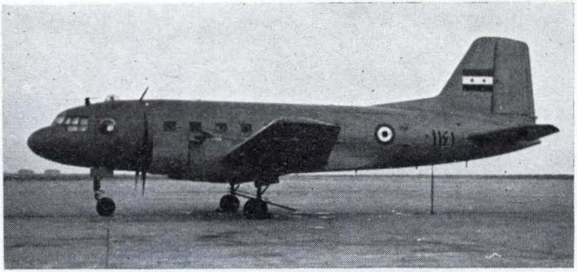
Fighters: North American F-86F Sabre. *Fighter-bombers:* Republic F-84G Thunderjet, Grumman F8F-1D Bearcat. *Reconnaissance:* Lockheed RT-33A. *Helicopters:* Westland Dragonfly, Sikorsky S.55, Hiller 360. *Transports:* Douglas C-54, Douglas C-47, Beech C-45. *A.O.P.:* Cessna L-19A Bird Dog. *Trainers:* North American T-6 Texan, Lockheed T-33A, de Havilland Chipmunk T.30. *Communications and Liaison :* Piper L-4, Piper L-18, Stinson L-5 Sentinel, Cessna 170.

TUNISIA. The *Armée de l'Air Tunisienne*, or Tunisian Air Army, received its first aircraft in November 1960 with the arrival of the first nine of fifteen SAAB-91D Safir trainers ordered during the previous April. Ten flying instructors and technicians from the Swedish *Flygvapnet* are assisting the Tunisians in the establishment of an air force training centre, and it is reported that Russia has offered Tunisia military aircraft, but no plans have yet been announced concerning the formation of combat units.

TURKEY. The Turkish Air Force, together with the Greek Air Force, forms the 6th A.T.A.F., Turkish units providing seventy-five per cent of the operational components. The Turkish Air Force possesses twelve fighter-bomber squadrons equipped with the F-100D or in process of converting to this type from the F-84G, one reconnaissance-fighter squadron equipped with the RF-84F, and three day interceptor squadrons equipped with the Canadair Sabre Mks. 2 and 4 but reportedly to convert eventually to the all-weather rôle with the F-86D Sabre. Turkey is expected to receive a quantity of Fiat G.91 strike fighters under the Mutual Aid Programme, and is a possible future recipient of the F-104G Super Starfighter multi-purpose fighter. The fighter-bomber squadrons each have the standard N.A.T.O. strength of twenty-five aircraft and, together with the reconnaissance-fighter squadron and three interceptor squadrons, form Turkey's 1st and 3rd Tactical Air Forces. The Sabres are based primarily at Merzifon, and the Super Sabres use Eskisehir and Diyarbakir among other bases. Primary training is provided on the indigenous M.K.E.K.4 Uğur and the C.C.F.-built Mentor, twenty-four of the latter having been received from Canada, intermediate training is provided by the T-6G Texan, pupils then progressing to the T-33A-N Silver Star. One squadron is still equipped with the B-26B Invader light bomber, but these are now largely relegated to general-purpose duties such as target-towing, and the operational units are supported by a small transport group equipped principally with the C-47. Turkey's 2nd Tactical Air Force is actually the Defence Command and does not possess any operational formations at the present time. Total personnel strength is some 30,000 officers and men.

Fighters: Canadair CL-13 Sabre Mks. 2 and 4. *Fighter-bombers:* North American F-100D Super Sabre, Republic F-84G Thunderjet. *Reconnaissance Fighters:* Republic RF-84F Thunderflash. *Transports:* Douglas C-47, Beech C-45. *Trainers:* North American F-100F Super Sabre, Canadair T-33A-N Silver Star, C.C.F.-Beech Mentor, M.K.E.K.4 Uğur, North American T-6G Texan. *A.O.P.:* Piper L-18B and C. *Miscellaneous:* Douglas B-26B Invader, Lockheed RT-33A.

UNITED ARAB REPUBLIC. The Air Force of the United Arab Republic consists principally of Egyptian and Syrian components with a small Yemeni element. Although the relative strengths of the Egyptian and Syrian components are uncertain, the former is believed to possess at least one light bomber wing equipped with the Il-28, and four interceptor fighter and fighter-bomber wings equipped with the MiG-15 and MiG-17, and the latter reportedly possesses five MiG-17-equipped interceptor squadrons. It is known that the U.A.R. government made repeated requests to Czechoslovakia and the Soviet Union for the supply of supersonic MiG-19 fighters since Super Mystères were obtained by Israel, but there is as yet no concrete evidence of the receipt of such fighters. Although some training is undertaken in Syria, most flying training for both Egyptian and Syrian aircrew takes place at the Air Force Flying College at Bilbeis and other training schools in Egypt. Primary and intermediate training is given at Bilbeis on the Yak-18, the Zlin 226 and the Yak-11, and jet conversion is undertaken at Fayid on MiG-15UTIs and Il-28Us. The Air Force hopes to introduce an Egyptian-built jet basic trainer during 1961 to replace the Yak-11. Known as *Al Kahira* (The Cairo), this trainer is a licence-built version of the Spanish HA-200-R1 Saeta which is being manufactured at Heliopolis. In Syria, fighter conversion is given at Hama under Russian supervision, and both the Egyptian and Syrian components of the Air Force of the U.A.R. possess transport elements equipped with the Il-14 and C-47. There has been an extensive programme of airfield construction and development in both Egypt and Syria in recent years. The third component of the Air Force of the U.A.R. is provided by the Yemen which possesses a small number of Il-10 attack aircraft, Yak-11 trainers and Mi-4 helicopters, together with a few light transports.

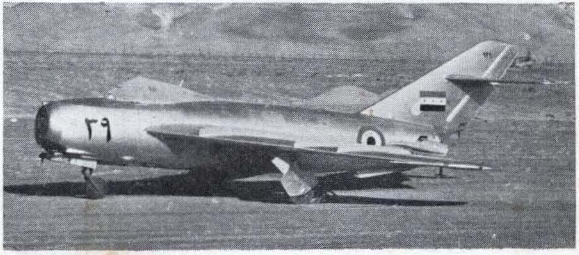


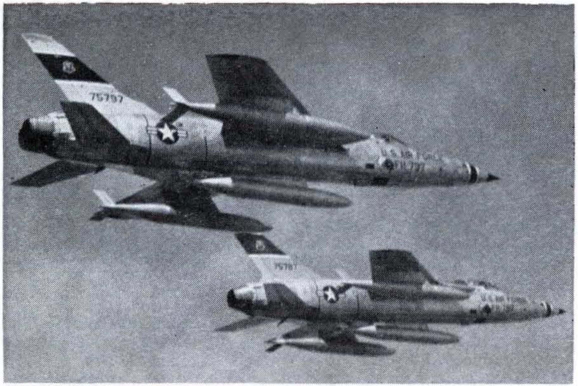
An Egyptian Il-14M paratroop transport of the U.A.R. Air Force

Fighters: MiG-17. *Fighter-bombers:* MiG-15. *Bombers:* Il-28. *Transports:* Il-14M, Douglas C-47, Beech C-45. *Helicopters:* Sikorsky S.51, SM-1 (Mi-1). *Trainers:* MiG-15UTI, Yak-11, Yak-18, Il-28U, Zlin 226, de Havilland Chipmunk, G.T.A.F. Gomhouria, C.C.F. Harvard.

URUGUAY. Uruguayan service aviation comprises the *Fuerza Aerea Uruguaya* (F.A.U.), or Uruguayan Air Force, and the *Escuela de Especializacion Aeronaval* (Specialist Naval Aviation School) which forms the small naval air arm. The F.A.U.

A Syrian MiG-17 interceptor fighter of the U.A.R. Air Force





F-105B Thunderchiefs of the 335th Sqdn., Tactical Air Command

possesses one bomber squadron equipped with the B-25J Mitchell, twelve of which were acquired in 1950, and one squadron of F-80C Shooting Star jet fighters. The F.A.U. received its first jet aircraft in 1955 when three T-33A jet trainers were supplied by the U.S. government. These were followed by three F-80C Shooting Star jet fighters in 1956, and an additional quantity of the latter was obtained in 1960 to replace the F-51D Mustangs, four of which were then sold to Bolivia. The transport element operates one DHC-2 Beaver and four C-47s, and the *Escuela de Especializacion Aeronaval* operates two PBM-5 Mariners for coastal patrol, and possesses a variety of other aircraft which are listed below in parentheses.

Fighters: Lockheed F-80C Shooting Star (Grumman F6F-5 Hellcat). *Bombers:* North American B-25J Mitchell. *Transports:* Douglas C-47, Beech C-45, de Havilland DHC-2 Beaver. *Patrol:* (Martin PBM-5 Mariner, Grumman J4F-1 Gosling). *Trainers:* De Havilland Chipmunk, Lockheed T-33A, North American T-6 Texan, Fairchild PT-26, Beech T-11B Kansan, (North American SNJ-4, Fairchild PT-23A). *Helicopters:* (Bell 47). *Miscellaneous:* Piper PA-12, Ryan L-17B Navion, (General Motors TBM-1C Avenger, Chance Vought OS2U-3 Kingfisher).

U.S.A. The United States Air Force is one of the two most powerful air arms in the world, although its strength has declined over the past five years from a peak of 414 combat squadrons, 18,860 aircraft and 925,000 personnel, to 316 combat squadrons, 16,941 aircraft and 825,000 personnel. Comprising sixteen operational Air Forces, plus numerous smaller formations, the U.S.A.F. is divided into the following commands: Strategic Air Command (S.A.C.), Tactical Air Command (T.A.C.), Air Defence Command (A.D.C.), the Military Air Transport Service (M.A.T.S.), the Air Training Command (A.T.C.), Continental Air Command (C.O.N.A.C.), Alaskan Air Command (A.A.C.), Caribbean Air Command (C.A.I.R.C.), U.S. Air Forces in Europe (U.S.A.F.E.), and Pacific Air Forces (P.A.C.A.F.). There are currently thirty-eight Strategic Wings, twenty Air Defence Wings, thirty-three Tactical Wings, sixty-six Air Refueling Squadrons, twenty-one M.A.T.S. Squadrons, and twenty-eight other specialised squadrons.

The Strategic Air Command, which is the U.S.A.'s principal instrument of deterrence, is based on the mixed force concept, intercontinental ballistic missiles and manned bombers complementing each other. During the course of 1962, S.A.C. is expected to attain its target of forty-two B-52 Stratofortress-equipped Strategic Wings each with fifteen aircraft. S.A.C. operates a continuous airborne alert, a number of its B-52 Stratofortresses being airborne around the clock, and a substantial additional proportion of the Stratofortress units are on constant ground alert, and can be bombed up and in the air within fifteen minutes of the order being given. One wing of B-58 Hustler supersonic medium bombers has been formed and a second is in process of formation, and as each new B-52 or B-58 wing is formed two B-47 Stratojet medium bomber wings are deactivated. At the present time, there are thirteen medium bomber wings each equipped with forty-five B-47E/II Stratojet medium bombers, and two strategic reconnaissance wings equipped with the RB-47H and RB-47K Stratojet. Some B-47s from disbanded wings are being assigned to active wings, increasing statutory strength by some ten per cent. A total of 564 KC-135As has been ordered, and 420 of these are being assigned to the forty-two Strategic Wings, the remainder being assigned to the two B-58 Hustler wings and independent refuelling squadrons. Several hundred KC-97G Stratotankers are currently in service with S.A.C., a squadron of twenty KC-97Gs being assigned to each B-47 wing. S.A.C. includes the 2nd Air Force with headquarters at Barksdale, La., the 8th Air Force with headquarters at Westover, Mass., the 15th Air Force with headquarters at March, Cal., and the 16th Air Force with headquarters at Torrejon, Spain, the last-mentioned formation being S.A.C.'s only overseas Air Force. S.A.C. units on rotation to Spanish or Moroccan bases come under the 16th Air Force. S.A.C. possesses one Strategic Reconnaissance Wing (Light) equipped with Martin RB-47Ds and Lockheed U-2s, this being responsible for special reconnaissance missions. Current plans call for twenty-seven S.A.C. I.C.B.M. squadrons of which thirteen are being equipped with the Convair Atlas and fourteen with the Martin Titan. There will also be a minimum of nine Boeing Minuteman missile squadrons deployed aboard railway trains.

Tactical Air Command, another major operational element of the U.S.A.F., comprises the 9th and 12th Air Forces with headquarters at Shaw, S.C., and Waco, Texas, respectively, and the 19th Air Force with headquarters at Seymour Johnson, N.C. The last-mentioned Air Force, which is known as the " Composite Air Strike Force ", is concerned with operations and planning, and has no operational aircraft, drawing its forces from the 9th and 12th Air Forces when needed. T.A.C. currently possesses approximately a dozen Tactical Fighter Wings each comprising four squadrons of eighteen aircraft. The bulk of the units are equipped with the F-100C and F-100D Super Sabre which are now being progressively replaced by the F-105D Thunderchief, but one wing is equipped with the F-105B Thunderchief and another is equipped with the F-104C Starfighter. A substantial proportion of the T.A.C. Fighter Wings are on rotational duty in West Germany, Spain, Turkey, Italy, Korea and Formosa. In addition to the Fighter Wings, T.A.C. has one Tactical Reconnaissance Wing equipped with the RF-101C Voodoo and the RB-66C Destroyer, and five Troop Carrier Wings of three squadrons of eighteen aircraft. Three of these Wings are equipped with the C-130A Hercules and the other two have the C-130B Hercules. There are also three Combat Crew Training Wings under T.A.C. control.

Air Defence Command, which is responsible for the defence of major strategic targets, phased out the last of its subsonic interceptors in 1960, and its manned interceptor force now comprises nineteen Fighter-Interceptor Wings of F-101B Voodoo, F-102A Delta Dagger and F-106A and F-106B Delta Dart supersonic all-weather interceptors. An A.D.C. Fighter-Interceptor Squadron normally comprises twenty-five F-102As or eighteen F-101s or F-106s. There are thirty-five to forty bases in the U.S.A. from which A.D.C. interceptor squadrons operate, and there are two Airborne Early Warning and Control Wings each equipped with forty EC-121s and based at Otis and McClellan Air Force Bases. Current plans call for fourteen A.D.C. Bomarc surface-to-air missile bases, each base having twenty-eight launchers.

The Military Air Transport Service operates over a route distance exceeding 115,000 miles throughout the world, and is equipped primarily with four-engined transports, the most modern of which are thirty-five C-133A and fifteen C-133B Cargomasters, and ninety-nine C-130E Hercules and thirty C-135 transports are on order with deliveries to M.A.T.S. commencing in March 1962, but a substantial re-equipment programme will have to be undertaken within the next few years owing to the approaching obsolescence of the bulk of M.A.T.S. aircraft, and the Lockheed C-141 transport is being developed for this purpose. At the present time, M.A.T.S. operates twenty-four squadrons with some 480 transports, including 100 C-118s, fifty-five C-121s and 290 C-124s, and in addition to transport aircraft, M.A.T.S. includes an Air Rescue Service and an Air Weather Service Division. The M.A.T.S. Air Transport Wings are assigned to the Eastern Transport Air Force (EASTAF) and the Western Transport Air Force (WESTAF).

U.S. Air Forces in Europe, or U.S.A.F.E., is committed to N.A.T.O., and comprises the 3rd Air Force with headquarters in the United Kingdom and the 17th Air Force with headquarters in West Germany. At the present time, U.S.A.F.E. possesses approximately one thousand aircraft, not including support and transport units. This total comprises six Tactical Fighter Wings, two Tactical Reconnaissance Wings, one Tactical Bomber Wing, one Fighter-Interceptor Wing, two

The T-38A Talon is currently entering service with the U.S.A.F.

Troop Carrier Wings, five Fighter-Interceptor Squadrons, one Tactical Fighter Squadron, and one Air Refuelling Squadron. Apart from one wing equipped with seventy-five F-101C Voodoos, the Tactical Fighter units are equipped with the F-100D Super Sabre, each wing comprising three squadrons of twenty-five aircraft. During 1961, U.S.A.F.E. is receiving its first F-105D Thunderchiefs and has begun to phase out the Super Sabre. The Tactical Bombing Wing has forty-eight B-66B Destroyers; one Tactical Reconnaissance Wing has seventy-two RB-66 and WB-66 Destroyers and the other has seventy-two RF-101 Voodoos; the Fighter-Interceptor units are equipped with the F-102A Delta Dagger, and the Troop Carrier Wings have the C-123B Provider and the C-130A Hercules.

Pacific Air Forces (P.A.C.A.F.) operates between 750 and 1,000 aircraft of which approximately 550 are combat types from thirty airfields in the Pacific. The major command units are the 5th Air Force with headquarters in Japan, the 13th Air Force with headquarters in the Philippines, the 315th Air Division with headquarters in Japan, and the Hawaiian Air Defence Division with headquarters in Hawaii. There is also an Air Material Force, Pacific Area, which is part of the Air Material Command. P.A.C.A.F. has seven or eight bases in Japan, three bases and two auxiliary fields in Korea, and other bases on Formosa, Guam, Iwo Jima, Johnston Island, Kwajalein and in the Philippines. It has two Fighter-Interceptor Wings equipped with the F-102A, three Tactical Fighter Wings equipped with the F-100 Super Sabre, one Tactical Reconnaissance Wing equipped with RF-101 Voodoos, one Tactical Bomber Wing with B-57Bs and one Troop Carrier Wing with C-130 Hercules. Alaskan Air Command (A.A.C.) is concerned primarily with early warning duties and the air defence and support of S.A.C. Alaskan bases. It possesses only one Fighter-Interceptor Squadron with thirty-three F-102As and based at Elmendorf and Eilson Air Forces Bases.

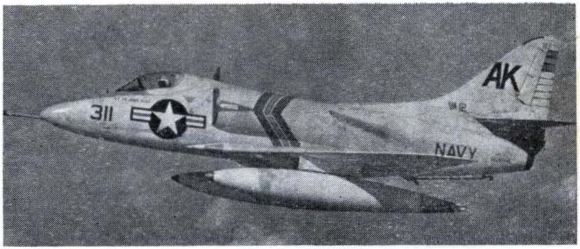
The Air National Guard, the first-line reserve of the U.S.A.F., has ninety-two flying and 114 non-flying units. The flying units comprise forty-one Fighter-Interceptor squadrons each with twenty-five aircraft (twelve equipped with F-89J Scorpions, four with F-104A Starfighters, five with F-102A Delta Daggers, two with F-100A Super Sabres, and the remainder with F-86D and F-86L Sabres), forming twelve Air Defence Wings; twenty-one Tactical Fighter squadrons each with twenty-five aircraft (one equipped with F-100A Super Sabres and three equipped with F-100Cs, the remainder operating F-84F Thunderstreaks); fourteen Tactical Reconnaissance squadrons each with eighteen RB-57s or RF-84F Thunderflashes forming four Tactical Reconnaissance Wings; six Long Range Heavy Transport (Cargo Carrier) squadrons each equipped with eight C-97 Stratofreighters; five Aeromedical Evacuation squadrons each with eight C-119Gs; four Medium Troop Transport squadrons with various aircraft, including SA-16A Albatrosses, and one Medium Transport Squadron. Nine more A.N.G. Long Range Heavy Transport squadrons are to be formed with C-97s, four more A.N.G. Aeromedical Evacuation squadrons are to be formed with C-119Gs, and there will be four A.N.G. Refuelling Tanker squadrons with KC-97Gs. There is also a U.S.A.F. Air Reserve comprising fifteen Troop Carrier Wings with forty-five squadrons each of sixteen C-119Gs or C-123Bs. During the course of 1961 at least six of these squadrons will re-equip with C-124 Globemasters.

Interceptor Fighters: Convair F-102A Delta Dagger, Convair F-106A Delta Dart, McDonnell F-101B Voodoo, Northrop F-89J Scorpion, North American F-86D and F-86L Sabre. *Fighter-bombers:* Republic F-105B and F-105D Thunderchief, North American F-100C and F-100D Super Sabre, McDonnell F-101C Voodoo, Lockheed F-104C Starfighter. *Bombers:* Boeing B-47E/II Stratojet, Douglas B-66B Destroyer, Boeing B-52 Stratofortress, Convair B-58A Hustler, Martin B-57B. *Reconnaissance:* McDonnell RF-101A, Boeing RB-47H and RB-47K Stratojet, Douglas RB-66C and WB-66D Destroyer, Martin RB-57D. *Transports:* Beech C-45G and C-45H, Boeing, C-97 Stratofreighter, Convair C-131, Douglas C-47, Douglas C-54 Skymaster, Douglas C-118A, Douglas C-124 Globemaster, Fairchild C-119, Fairchild C-123B Provider, Lockheed C-130 Hercules, Douglas C-133 Cargomaster, Lockheed C-140. *Helicopters:* Bell H-13, Kaman H-43B Huskie, Sikorsky H-19, Vertol H-21. *Search and Rescue:* Grumman SA-16 Albatross, Douglas SC-54D, Boeing SB-29 Superfortress. *Liaison:* Cessna U-3A and U-3B, Aero L-26B and L-26C, Cessna L-27A, de Havilland L-20A Beaver. *Trainers:* Convair TB-58 Hustler, Beech TC-45G, Beech T-34A, Boeing ETB-47E Stratojet, Cessna T-37B, Convair T-29, Convair TC-131E, Convair TF-102A, Lockheed T-33A Shooting Star, North American T-39, North American F-100F Super Sabre, Northrop T-38A Talon, Martin B-57C. *Tankers:* Boeing KC-135A, Boeing KC-97 Stratofreighter, Boeing KB-50D Superfortress. *Miscellaneous:* Lockheed U-2, Lockheed QF-104 Starfighter, Lockheed EC-121.

The air arm of the U.S. Navy and Marine Corps comprises the third biggest air force in the world and the largest and most powerful marine air organisation in existence. Operating from fourteen fleet carriers, including four 75,000-ton "super-carriers", the *Forrestal*, the *Saratoga*, the *Ranger*, and the *Independence*, and nine anti-submarine aircraft carriers plus numerous shore bases, the U.S. Navy and Marine Corps possess sixteen carrier groups, eleven carrier anti-submarine squadrons, thirty-eight patrol and warning squadrons, and some 8,750 aircraft, and are backed by a very substantial Air Reserve which concentrates on anti-submarine warfare and operates from eighteen stations in the U.S.A.

At the present time, the U.S. Navy is introducing two new types of first-line combat aircraft, the McDonnell F4H-1 Phantom II two-seat shipboard interceptor and strike aircraft and the North American A3J-1 Vigilante two-seat attack bomber. It is also preparing for the introduction of the Grumman A2F-1 Intruder low-level strike aircraft and Lockheed Orion shore-based long-range maritime reconnaissance aircraft, and evaluating the Grumman W2F-1 Hawkeye early warning aircraft. The U.S. Navy's carriers, which are distributed among the 1st, 4th, 6th, and 7th Fleets, the composition of which change completely every four to six months, normally carry mixed Air Groups, a typical Carrier Air Group for a *Forrestal*-class carrier consisting of some ninety aircraft and comprising two limited all-weather fighter squadrons each with fourteen F3H-2 Demons or F8U-2 Crusaders, three light attack squadrons each with twelve A4D-2 Skyhawks or AD-6 Skyraiders, one heavy attack squadron with twelve A3D-2 Skywarriors, and tactical reconnaissance and early warning detachments with F8U-1P Crusaders and WF-2 Tracers respectively, plus Vertol HUP-1 Retriever helicopters for plane-guard duties and TF-1 Traders for logistics support. An anti-submarine aircraft carrier normally has a hunter-killer group, of which there are seven, comprising a squadron of twenty S2F-1 or -3 Trackers, a squadron of fourteen HSS-1 helicopters and a detachment of WF-2 Tracer or AD-4W Skyraider early warning aircraft. There are currently three Anti-submarine Aircraft Groups in the Atlantic and four in the Pacific. The 1st Fleet has four attack carriers in the Pacific and the 4th Fleet has a similar number of carriers in the Atlantic. The 6th Fleet has three attack carriers in the Mediterranean and the 7th Fleet has a similar number of carriers in the Western Pacific.

The U.S. Navy currently possesses some forty fighter squadrons of which five are Replacement Carrier Air Group squadrons. One squadron, VF(AW)-3 with twenty-five F4D-1 Skyrays, is assigned to N.O.R.A.D., and VF(AW)-4 provides fighter detachments for anti-submarine carriers in the Atlantic, the others being assigned to the Carrier Air Groups, two being assigned to each Group. There are some fifty-five attack squadrons, five of these serving with the Replacement Carrier Air Groups and the rest being assigned to the Carrier Groups, each Group having two or three attack squadrons. Approximately half of the attack squadrons are equipped with the A4D Skyhawk, approximately seven have FJ-4B Furies and the remainder have AD-5 and AD-6 Skyraiders, although these are in process of being replaced by the Skyhawk. The A3D Skywarrior-equipped heavy attack squadrons of which there are twelve have a complement of eight or twelve aircraft depending upon the class of carrier to which the unit is assigned, the *Midway* class carriers having eight-plane squadrons. There are four shipboard reconnaissance squadrons, VFP-62 and VCP-63 supplying F8U-1P Crusader detachments to attack carriers in the Atlantic and Pacific Fleets respectively,



An A4D-2 Skyhawk of U.S. Navy Attack Squadron VA-12

A Mentor trainer of the Venezuelan Escuela de Aviación Militar

and VAP-62 and VCP-61 using A3D-2P Skywarriors for long-range reconnaissance in the Atlantic and Pacific respectively. The four shipboard Airborne Early Warning squadrons vary appreciably in strength and employ a mixture of WF-2 Tracers, and AD-5N, -5Q and -5W Skyraiders.

The U.S. Navy currently operates some thirty shore-based maritime reconnaissance and patrol squadrons of which some two-thirds have P2V-5, -5F and -7 Neptunes, the remainder having P5M-2 Marlin flying boats, the latter being deployed to bases in the Pacific, Atlantic, Caribbean and Mediterranean where seaplane facilities are available. There are two Fleet Air Reconnaissance squadrons (formerly designated Electronics Countermeasures squadrons) equipped with P4M-1Q Mercators and A3D-2Q Skywarriors, and there are some six Airborne Early Warning squadrons each with a statutory strength of twelve Lockheed WV-2s. Two of these squadrons, VW-12 and VW-14, have been combined to form the Airborne Early Warning Barrier, Pacific, maintaining a constant patrol from Barbers Point to Midway Island to Kodiak, Alaska, and VW-11, -13 and -15 form the Airborne Early Warning Barrier, Atlantic. The sixth squadron, VW-4, performs weather reconnaissance missions. Detachments of the Helicopter Utility squadrons operate from all major vessels in the Atlantic and Pacific Fleets, and the Utility squadrons operating fixed-wing types are organised into Fleet Utility Wings, there being one Wing for the Atlantic Fleet and one for the Pacific Fleet. There are at least twenty-three U.S. Navy training squadrons, their missions and equipment varying widely, examples being VT-28 with fifty-five S2F-1 Trackers at Corpus Christi, VT-5 with seventy-eight T-28C Trojans at Saufley Field, and BTG-7 with between eighty and ninety T2V-1 SeaStars and T-28C Trojans for instrument training at Memphis.

The U.S. Navy's air transport tasks are performed by eight transport squadrons, two of which, equipped with Douglas R6D-1s, are assigned to the Eastern Division of M.A.T.S., and a further two, equipped with Lockheed R7V-1s, are assigned to the Western Division of M.A.T.S. Two squadrons are equipped with TF-1 Traders as are also the shipboard transport squadrons. The Naval Air Reserve has approximately 400 squadrons stationed at eighteen bases and some thirty per cent of these are flying units. As previously mentioned, the Reserve is primarily concerned with anti-submarine warfare for which it operates Neptunes, Trackers and HSS-1 helicopters.

The three aircraft wings of the U.S. Marine Corps form an integral part of the U.S. Naval air arm. Each of the three wings has a statutory strength of seventeen squadrons of twenty aircraft, and a U.S. Marine Corps Wing normally consists of three day interceptor squadrons of F8U-1 Crusaders, two limited all-weather interceptor squadrons of F4D-1 Skyrays, four ground attack squadrons of A4D-1 or -2 Skyhawks, one reconnaissance squadron of Cessna OE-1s, one reconnaissance squadron of F8U-1P Crusaders, two assault transport squadrons with such aircraft as the Lockheed GV-1, three helicopter transport squadrons with Sikorsky HUS-1s, and one helicopter transport squadron with Sikorsky HR2S-1s. The Marine Air Reserve has fifty-six aircraft squadrons forming eighteen Reserve Air Groups. Seventeen of the squadrons operate helicopters, and the remainder are fighter squadrons with FJ-3 and -4 Furies and attack squadrons with Skyraiders and Skyhawks.

Fighters: McDonnell F4H-1 Phantom II, Chance Vought F8U-1, -2 and -2N Crusader, Douglas F4D-1 Skyray, Grumman F11F-1 Tiger, McDonnell F3H-2M and -2N Demon. *Attack Aircraft:* Douglas A4D-1, -2 and -2N Skyhawk, Douglas A3D-2 Skywarrior, Douglas AD-4, -5, -6, and -7 Skyraider, North American A3J-1 Vigilante. *Maritime Reconnaissance and Anti-submarine:* Lockheed P2V-5F and -7 Neptune, Lockheed P3V-1 Orion, Martin P5M-2 Marlin, Grumman S2F-1, -3 Tracker. *Reconnaissance:* Douglas A3D-2P Skywarrior, Chance Vought F8U-1P Crusader. *Early Warning:* Grumman WF-2 Tracer, Lockheed WV-2. *Transports:* Douglas R4D-8, Lockheed GV-1, Convair R4Y-1, Grumman TF-1 Trader, Beech JRB-5 and -6, Fairchild R4Q-1 and -2, Douglas R5D, Douglas R6D-1, Lockheed R7V-1. *Helicopters:* Kaman HU2K-1 Seasprite, Sikorsky HO4S (HRS), Sikorsky HR2S-1, Sikorsky HUS-1 (HSS-1), Sikorsky HSS-2 (HR3S-1), Kaman HTK-1, Kaman HUK-1, Bell HTL-6 and -7, Vertol HRP-2, Vertol HUP-4. *Trainers:* Lockheed TV-2, Lockheed T2V-1 SeaStar, Douglas A3D-2T, Temco TT-1 Pinto, Grumman F9F-8T Cougar, North American T2J-1 Buckeye, Beech SNB-5. *Miscellaneous:* Grumman UF-1 and -2, Cessna OE-1 and -2, de Havilland UC-1.

U.S. Army Aviation currently operates some 2,880 fixed and 2,770 rotary wing aircraft of a wide variety of types, the largest being the de Havilland AC-1 Caribou, sixty-one examples of which have been ordered. The primary tasks of Army Aviation are observation, reconnaissance, liaison, logistic support and casualty evacuation. Apart from the previously-mentioned Caribou, the U.S. Army is currently introducing the turbine-powered Bell HU-1A Iroquois helicopter, 110 examples of which have been ordered, and the Grumman AO-1 Mohawk front-line observation aircraft which carries a high resolution optical photographic system and infra-red surveillance equipment or side-looking aircraft radar. Eighty-eight Mohawks have been ordered.

The U.S. Army trains 500 helicopter and 780 fixed-wing pilots each year. Each of the six U.S. Field Armies has four Transport Aviation Battalions assigned to it, each Battalion comprising three Light Transport Companies (with twenty H-21 or H-34 helicopters), one Medium Transport Company (with sixteen H-37 helicopters) and one Tactical Fixed Wing Company (with sixteen U-1A Caribous). Each of the Army's fourteen divisions has a Combat Aviation Company with fifty aircraft assigned to it. Each Combat Aviation Company is to receive four AO-1 Mohawks, approximately 250 of which are scheduled to be acquired by 1966.

Transports: De Havilland AC-1 Caribou, de Havilland U-1A, de Havilland L-20. *Observation:* Grumman AO-1 Mohawk, Cessna L-19A and E Bird Dog. *Liaison:* Aero Commander L-26B and C, Beech L-23B, D, E, and F, Cessna L-27A, Ryan L-17B and C. *Helicopters:* Bell HU-1A Iroquois, Bell H-13 Sioux, Hiller H-23 Raven, Vertol H-25A Army Mule, Sikorsky H-34A Choctaw, Sikorsky H-37A Mojave, Vertol H-21 Shawnee. *Trainers:* Cessna TL-19D Bird Dog. *Miscellaneous:* Piper L-21 Super Cub, Cessna LC-126A.

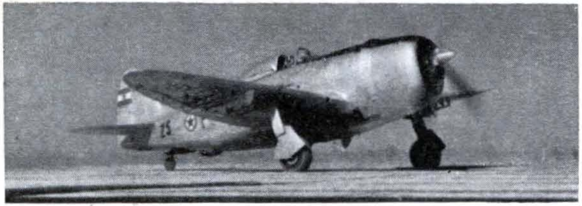
VENEZUELA. The *Fuerzas Aéreas Venezolanas* (Venezuelan Air Forces), or F.A.V. are among the most efficient of South American air arms and possess relatively modern equipment. At the present time, the F.A.V. possess six combat squadrons. Two of these are day interceptor squadrons equipped with the F-86F Sabre, two are fighter-bomber squadrons, one equipped with Vampire F.B.5s and the other equipped with Venom F.B.4s, and two bomber squadrons, one equipped with Canberra B.2s and B.(I).8s, and the other equipped with B-25J Mitchells. There are several transport squadrons principally equipped with the C-123B Provider, eighteen of which were obtained in 1958, together with small numbers of C-47s and C-54s. F.A.V. personnel are largely trained in the country's own schools which also train cadets from other Latin-American air arms. The training organisation includes the *Escuela de Aviación Militar* (School of Military Aviation), the *Escuela Superior de las FF.AA.* (Superior School of the Air Forces), and the *Escuela de Aplicación de las F.A.V.* (School of Application of the Venezuelan Air Forces). The standard primary trainer is the Beech Mentor, the last of thirty-four of which was delivered to the F.A.V. in 1959. Intermediate training is provided on the T-6 Texan from which fighter pilots proceed to the Vampire T.55 and bomber pilots to the T-11B Kansan. Maritime patrol and rescue is undertaken by the SA-16A Albatross, and the F.A.V. possesses a number of helicopters. There are three air bases in the centre of Venezuela, one in the East and another in the West, and all but one of these can handle every type of aircraft employed by the F.A.V. Late in 1960, the Venezuelan government was considering the purchase of sixteen Hunter F.6s and four Hunter T.7s.

Fighters: North American F-86F Sabre. *Fighter-bombers:* De Havilland Vampire F.B.5, de Havilland Venom F.B.4. *Bombers:* English Electric Canberra B.2 and B.(I).8, North American B-25J Mitchell. *Transports:* Fairchild C-123B Provider, Douglas C-47, Douglas C-54, Beech D-18S, Beech 65 Queen Air. *Helicopters:* Bell 47G, Sikorsky S.51. *Patrol and Rescue:* Grumman SA-16A Albatross. *Trainers:* Beech T-34 Mentor, de Havilland Vampire T.55, English Electric Canberra T.4, North American T-6 Texan, Beech T-7 Navigator, Beech T-11B Kansan.

VIETNAM (DEMOCRATIC REPUBLIC OF). The northern zone of what was once French Indo-China and now known as the Democratic Republic of Vietnam possesses an air arm known as the Vietnamese People's Air Force, the development of which has been supervised by Russian and Sino-Communist instructors and advisers. It is believed to possess one operational squadron of MiG-17 jet fighters supplied by the Chinese government, a transport squadron equipped with the Li-2 and smaller types, and several army co-operation flights equipped with Russian-built trainers. The training of North Vietnamese personnel is undertaken in China.

VIETNAM (REPUBLIC OF). The southern zone of Vietnam, known as the Republic of Vietnam, possesses a small air arm entitled the Vietnam Air Force. In October 1960, a number of Vietnamese personnel underwent training on the AD-6 Skyraider at the U.S. Naval Air Station of Corpus Christi, and sufficient AD-6s to equip one squadron were delivered to Vietnam. The Vietnam Air Force also possesses one fighter-bomber squadron equipped with the F8F-1 Bearcat, two transport squadrons equipped with the C-47, and one air evacuation and rescue squadron equipped with the Sikorsky H-19 helicopter. There is a basic flying school at Nhatrang, and other bases include Tansonnhat, Tourane, and Bienhoa. Under the U.S. Military Aid Programme, a number of Vietnamese personnel have been trained in the Philippines.

Fighter-bombers: Grumman F8F-1 Bearcat. *Attack:* Douglas AD-6 Skyraider. *Transports:* Douglas C-47, Beech C-45.



Most J.R.V. Thunderbolts are now in storage

Helicopters: Sikorsky H-19. *A.O.P.:* Cessna L-19 Bird Dog.

YUGOSLAVIA. The *Jugoslovensko Ratno Vazduhoplovstvo* (J.R.V.), or Yugoslav Air Force is essentially a tactical arm, its only operational units being equipped with day interceptors and fighter-bombers. The major formation of the J.R.V. is the Air Corps of which there are two. These are sub-divided into Air Divisions (roughly equivalent to a U.S.A.F. wing), each of which possesses some seventy-five interceptors or fighter-bombers at full strength. The J.R.V. received its first jet combat aircraft in 1953, and has since acquired substantial numbers of F-84G Thunderjets and Canadair Sabres which now equip all first-line operational units. An additional 50–70 F-84G Thunderjets were acquired from Greece in the summer of 1960. The J.R.V. currently possesses some 300 Thunderjets and about 150 Sabres which equip four fighter-bomber divisions and two day interceptor divisions. The J.R.V.'s Flying Training Corps has its headquarters at Mostar and schools at Batajnica, Titograd, Niksic, Zalusani and Pola. The nationally-designed Aero 2 and Aero 3 trainers are used for the primary phase, pupils progressing to the Type 522 and then to the T-33A for jet pilots and the Type 214-D for transport pilots. There is a J.R.V. Technical Academy for technical officers, a Higher Air Force Academy, a Higher Air Force Technical Officers' School and an Air Force Application School.

Fighters: Canadair CL-13 Sabre Mks. 2 and 4. *Fighter-bombers:* Republic F-84G Thunderjet. *Reconnaissance:* Lockheed RT-33A. *Transports:* Ilyushin Il-14, Douglas C-47. *Helicopters:* Westland Dragonfly. *Trainers:* Lockheed T-33A, Aero 2, Aero 3, Type 214-D, Type 213 Vihor, Type 522. *A.O.P.:* Kurir. *Miscellaneous:* De Havilland DHC-2 Beaver Republic F-47D Thunderbolt, S-49C.

The fighter squadrons of the Jugoslovensko Ratno Vazduhoplovstvo possess some 150 Sabres which equip two divisions

THE INSIGNIA OF THE WORLD'S AIR FORCES

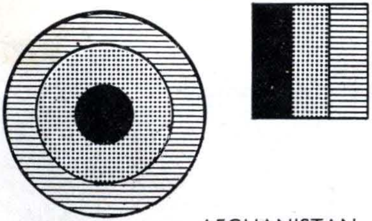
The insignia of the world's air forces illustrated on the following pages has been corrected to the date of closing for press. However, the insignia borne by the military aircraft of the republics of the Congo, Guinea and Senegal were not available at that date and, in view of the fluctuating state existing in the Congo, that of the Congolese break-away province of Katanga (green-red-white roundel with three yellow diagonal crosses superimposed on the centre white core) has been omitted.

The principal insignia illustrated in the left hand side of each panel normally appears on the upper and lower surfaces of the wings and on the fuselage sides. In the case of Lebanese and some Cambodian military aircraft, a miniature reproduction of this insignia is painted on the vertical tail surfaces. Some air forces, notably those of Dominica, Peru, the Philippines, Portugal, Salvador and the U.S.A., have the insignia painted above the port wing and beneath the starboard wing only. A larger number of air forces do not paint their national insignia on the fuselage sides of their aircraft. The insignia shown for the Royal Australian Air Force appears on the fuselage sides only, R.A.F.-type roundels appearing on the wing surfaces. Some South Vietnamese aircraft (notably Douglas C-47 transports) have an alternative fuselage insignia which resembles that of the U.S.A.F. but has red and orange bars which, together with the white star on a blue circular field, have a red surround. The insignia shown for the Argentine Naval Air Arm appears on the fuselage sides only, a black anchor appearing on the wing surfaces. A similar black anchor appears in addition to the national insignia on the upper and lower wing surfaces of Uruguayan naval aircraft.

Tail markings, where applicable, are illustrated in the top right hand corner of each panel, but it should be noted that, on military aircraft of Nationalist China, France, Iran, the Lebanon, Spain, and all Latin American countries with the sole exception of Brazil, these occupy the entire rudder area, while tail markings of other countries appear in smaller form as illustrated. Aircraft of the Albanian Air Force carry a Soviet-type red star as an additional tail marking.

Aircraft attached to the United Nations Organisation, irrespective of their nationality, carry the blue-and-white U.N.O. symbol on the upper and lower surfaces of the wings and on the tail fin, this being accompanied by " UNITED NATIONS " painted in large black letters along the fuselage sides and across the upper and lower surfaces of the wings.

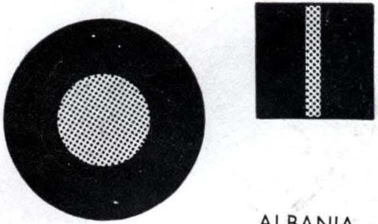
It should be noted that the position of national insignia on aircraft fuselage sides varies considerably, sometimes appearing on the nose of the fuselage (e.g. German F-104F on page 25, British Lightning on page 28, Indonesian Gannets on page 34, Mexican Vampire on page 42, and Swedish Drakens on page 53), and at other times aft of the wings (e.g. Ethiopian SAAB-17s on page 22, Ghanaian Beaver on page 27, and Jordanian Hunter on page 39).



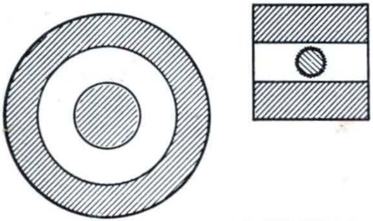
AFGHANISTAN

▩ RED

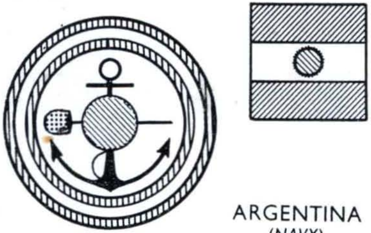
▤ GREEN



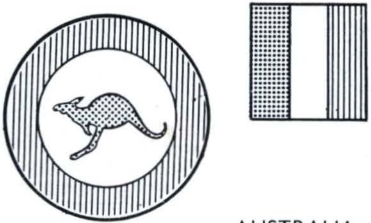
ALBANIA



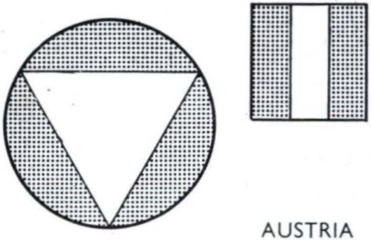
ARGENTINA



ARGENTINA
(*NAVY*)



AUSTRALIA



AUSTRIA

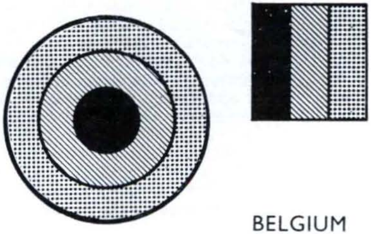
▦ RED

▧ YELLOW

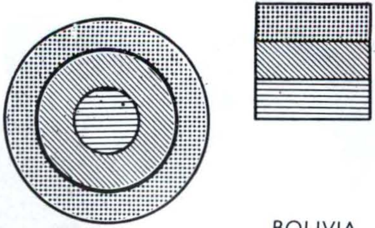
▥ BLUE

▨ AZURE

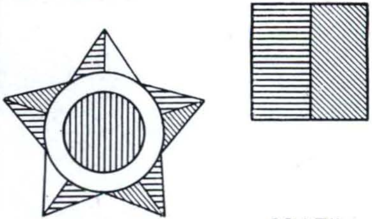
▤ GREEN



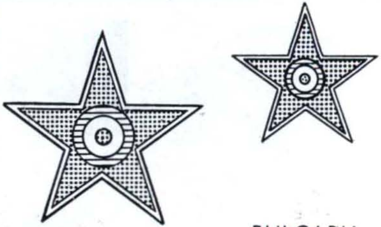
BELGIUM



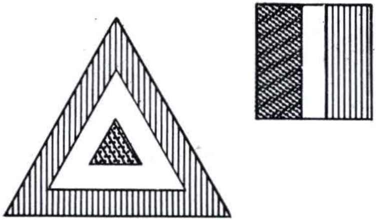
BOLIVIA



BRAZIL



BULGARIA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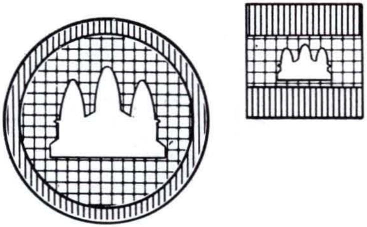
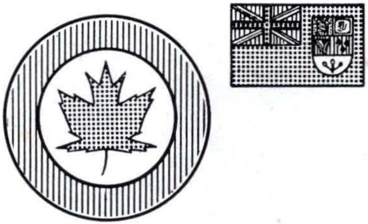
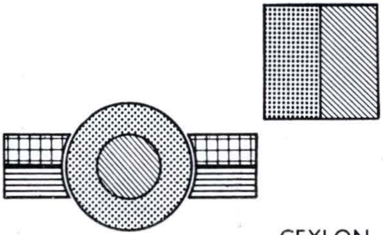
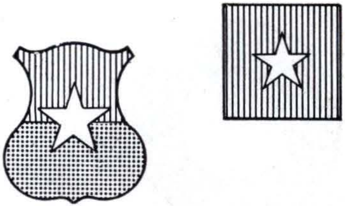
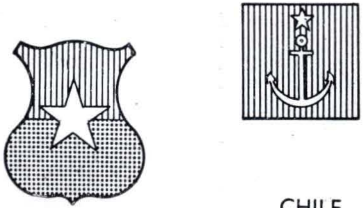

CAMBODIA

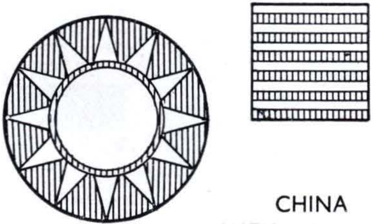

CANADA


CEYLON

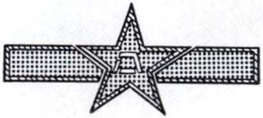
░ RED
▥ BLUE
▤ GREEN
▧ YELLOW
▦ ORANGE
▩ GOLD

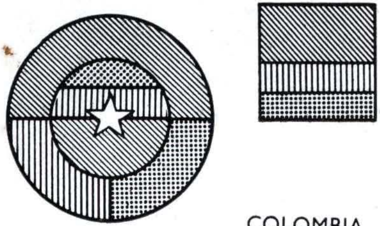

CHILE


CHILE
(*NAVY*)

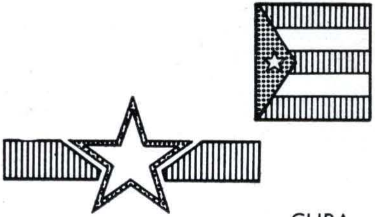

CHINA
(*NATIONALIST*)

NO
TAIL
INSIGNIA

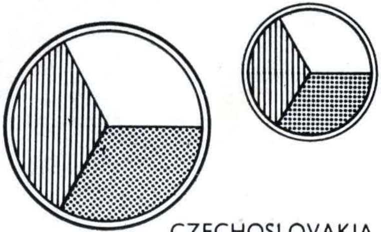

CHINA
(*COMMUNIST*)



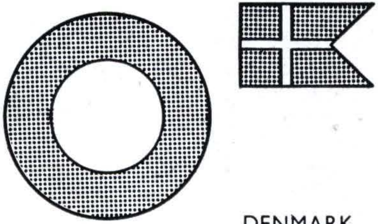
COLOMBIA



CUBA



CZECHOSLOVAKIA



DENMARK

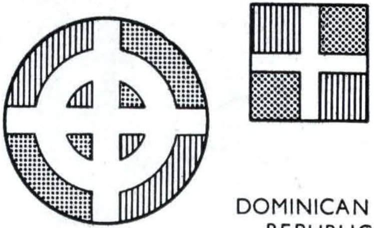
▦ RED

▨ YELLOW

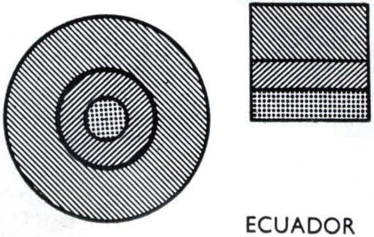
▥ BLUE

▧ AZURE

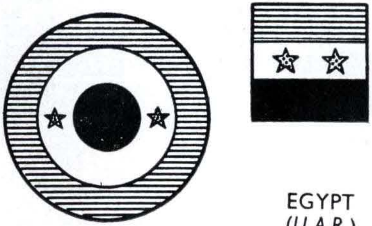
▤ GREEN



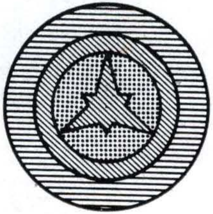
DOMINICAN REPUBLIC



ECUADOR



EGYPT (*U.A.R.*)



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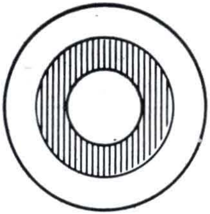
ETHIOPIA



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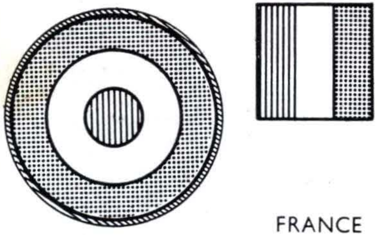
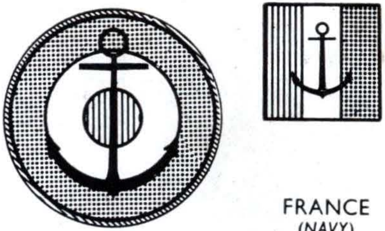
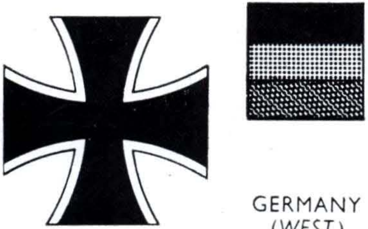
FINLAND



FRANCE



FRANCE (*NAVY*)



GERMANY (*WEST*)

░ RED

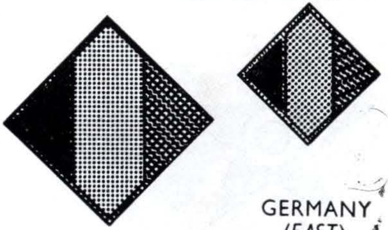
▥ BLUE

▤ GREEN

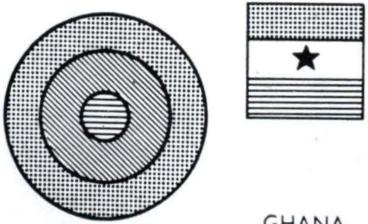
▧ YELLOW

▨ AZURE

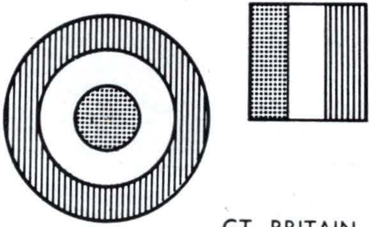
▩ GOLD



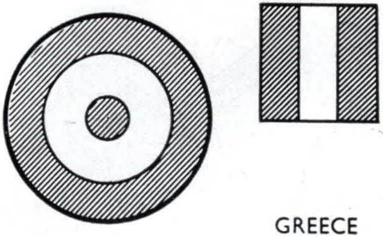
GERMANY (*EAST*)



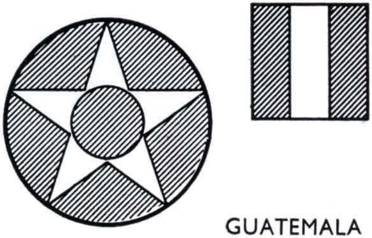
GHANA



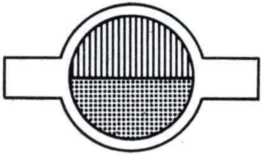
GT. BRITAIN



GREECE



GUATEMALA



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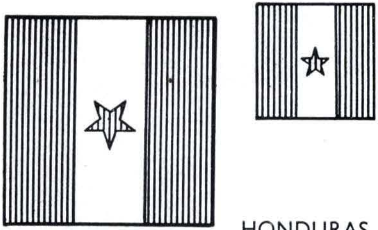
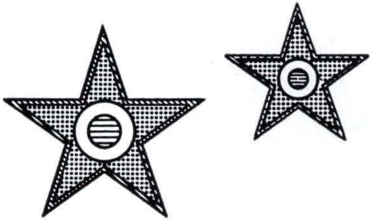
HAITI



HONDURAS



HUNGARY

▦ RED

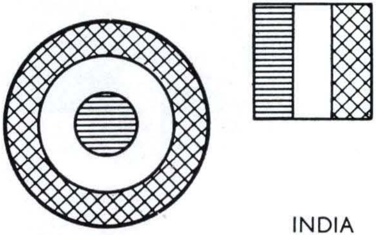
▥ BLUE

▤ GREEN

▧ YELLOW

▨ AZURE

▩ SAFFRON



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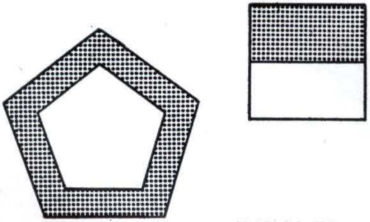

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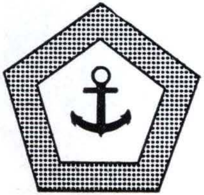

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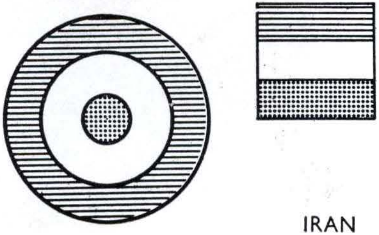
(NAVY)



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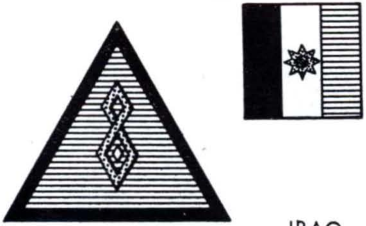

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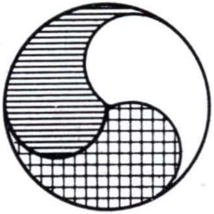

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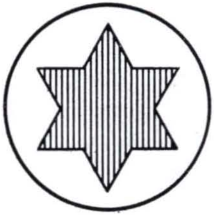

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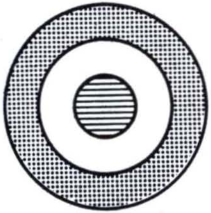


NO
TAIL
INSIGNIA

ITALY

▒ RED

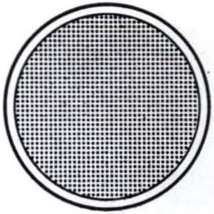
▥ BLUE

▤ GREEN

▧ YELLOW

▨ AZURE

▦ ORANGE



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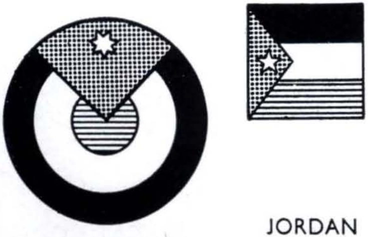

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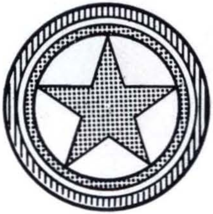

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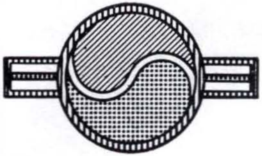
KOREA
(NORTH)



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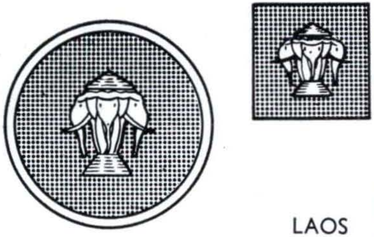
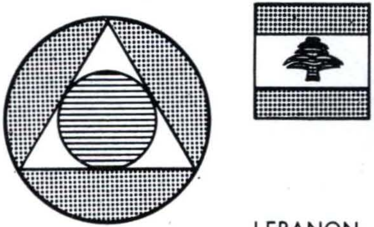
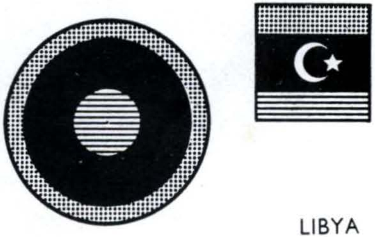
KOREA
(SOUTH)



LAOS



LEBANON



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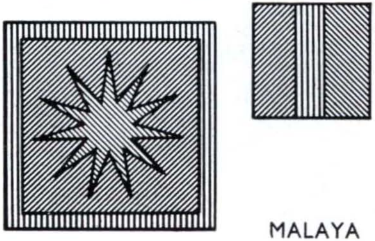


MALAYA

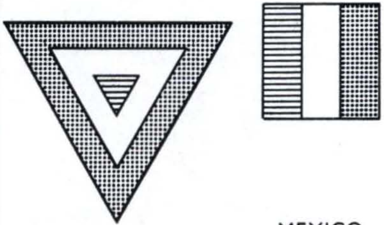
▦ RED

▧ YELLOW

▥ BLUE

▨ AZURE

▤ GREEN



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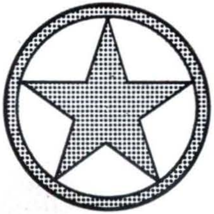

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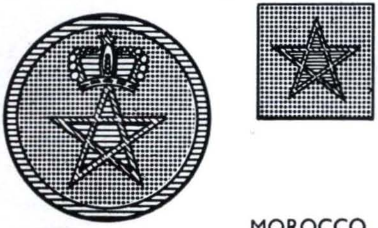
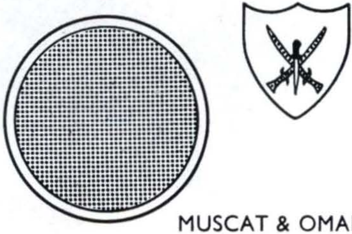
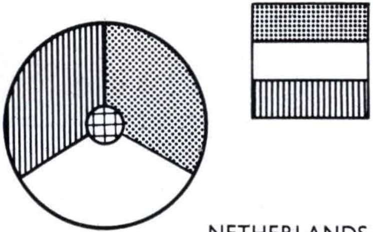
MONGOLIA



MOROCCO



MUSCAT & OMAN



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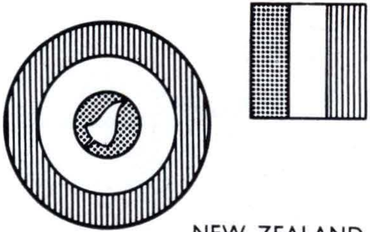

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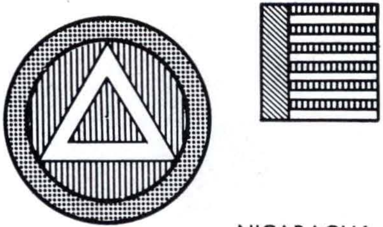

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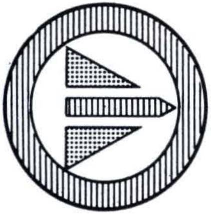
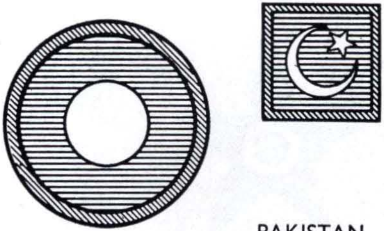


NO TAIL INSIGNIA

NORWAY

░ RED
▨ YELLOW
▥ BLUE
▦ ORANGE
▤ GREEN



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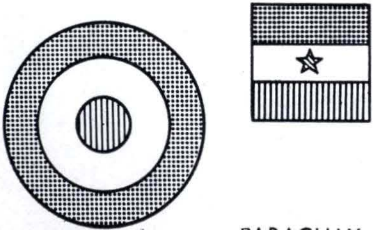

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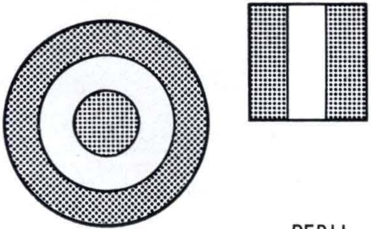
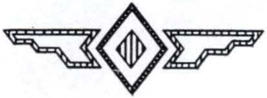


PERU

NO TAIL INSIGNIA



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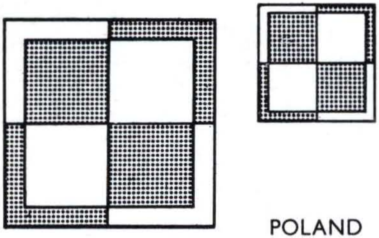
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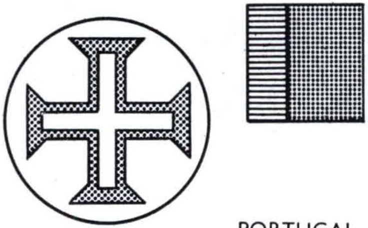
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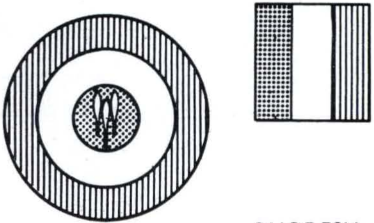
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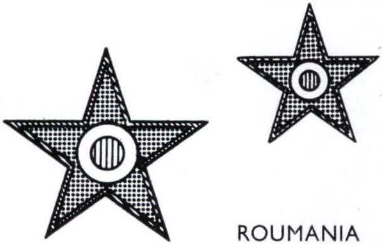
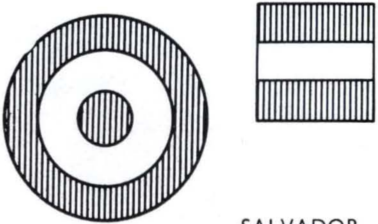

ROUMANIA

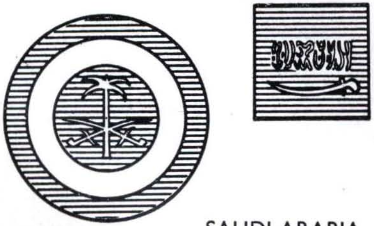
▦ RED

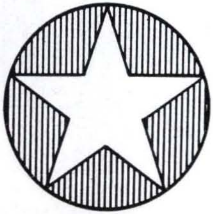
▤ GREEN

▥ BLUE

▨ YELLOW


SALVADOR


SAUDI-ARABIA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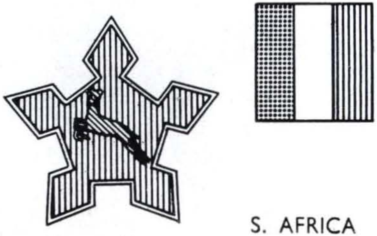
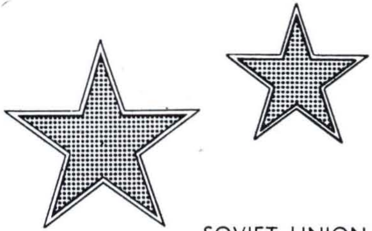
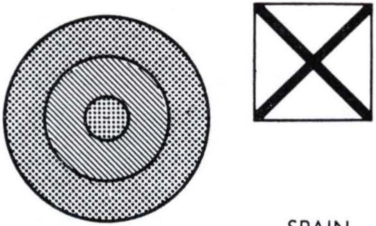

S. AFRICA



SOVIET UNION



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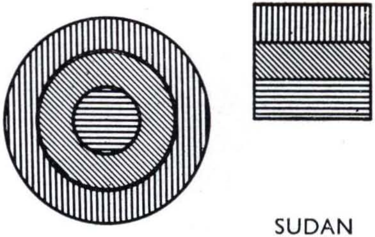

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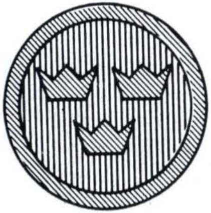


NO TAIL INSIGNIA

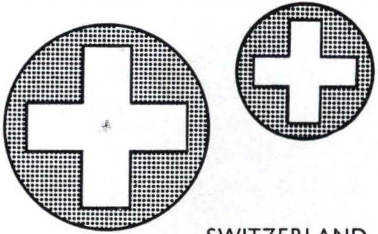
SWEDEN

▦ RED

▤ GREEN

▥ BLUE

▧ YELLOW



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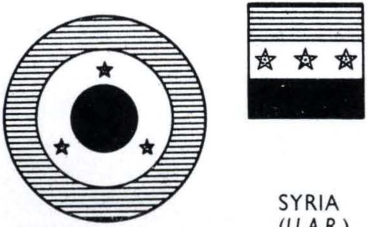

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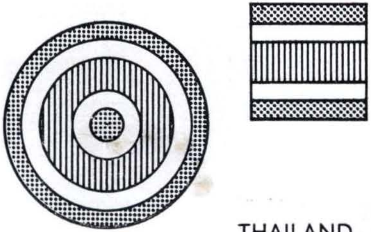
(U.A.R.)



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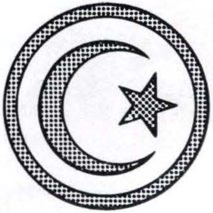

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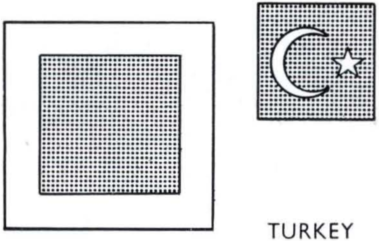

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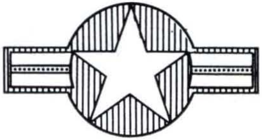

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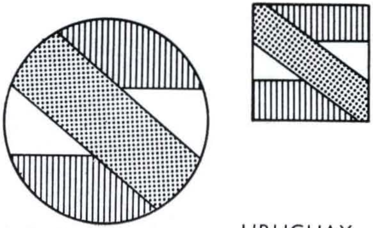
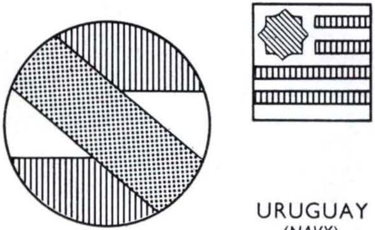
U.S.A.



URUGUAY



URUGUAY
(NAVY)

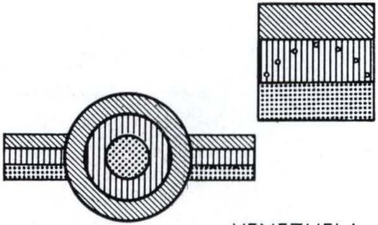
░ RED

▧ YELLOW

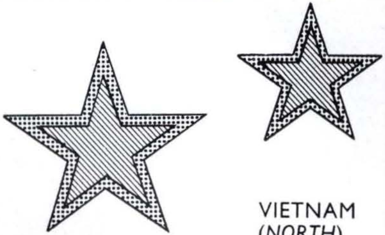
▥ BLUE

▦ ORANGE

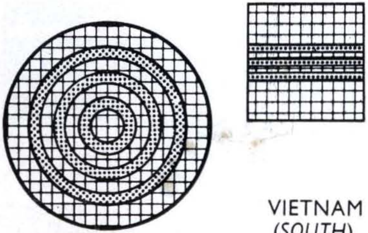
▨ AZURE



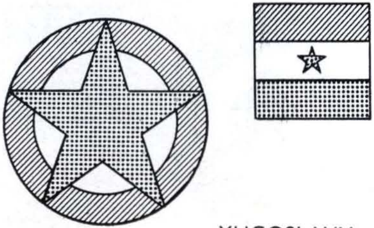
VENEZUELA



VIETNAM
(NORTH)



VIETNAM
(SOUTH)

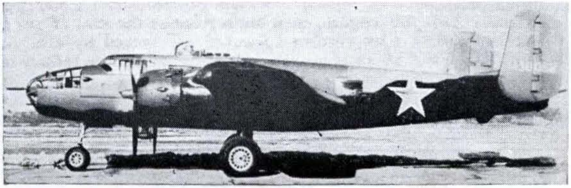


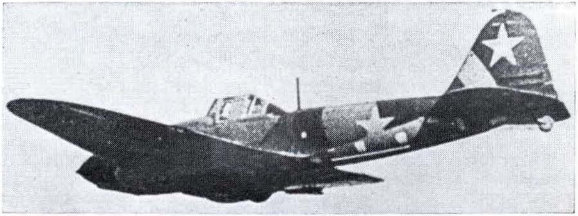
YUGOSLAVIA

OWING to difficulties in ascertaining the correct designations of Soviet aircraft, the North Atlantic Treaty Organisation nations adopted a system of identification names for the aircraft of both the Russian armed forces and civil organisations, this system supplanting an earlier series of " Type " numbers which were allocated by the U.S.A.F. to each new Russian aircraft type seen. For instance, the MiG-9 was the " Type 2 ", the Yak-23 was the " Type 28 ", and the Tu-16 was the " Type 39 ". The new system employed a simple key; the names allocated to bombers and attack aircraft commenced with the letter " B ", those for fighters and fighter-bombers commenced with the letter " F ", cargo and troop-carrying aircraft were allocated names commencing with the letter " C ", and the names for miscellaneous aircraft types (e.g. trainers, flying boats, transport gliders) commenced with the letter " M ". All rotorcraft were given identification names commencing with the letter " H ". Airscrew-driven (both piston-engined and turboprop-powered) machines were given identification names possessing only one syllable, while those for turbojet-driven machines contained two syllables. To indicate a variant of the basic type a suffix letter was attached to the identification name (e.g. Farmer-B, Farmer-C).

At first sight there would appear to be little uniformity among the individual Russian aircraft design bureaux in the allocation of designations to their progeny. However, when an aircraft is accepted for production for the Soviet Air Forces it is allocated a Sov.A.F. type number following that of the last aircraft type to be accepted from the design bureau concerned, odd numbers usually being applied to fighters (e.g. MiG-17, MiG-19, MiG-21) and even numbers to other types (e.g. Tu-12, Tu-14, Tu-16). It is only rarely that the Sov.A.F. designation is similar to that of the design bureau. An example of this is the first post-war design by Oleg K. Antonov to be accepted for quantity production for the Soviet Air Forces, the An-2. However, whereas meteorological research and float-plane variants of the basic design received the official designations An-2ZA and An-2V respectively, the design bureau designations for these variants were An-4 and An-6. The two systems of designating aircraft account for the disparity between the type numbers of such machines as the *Badger* (Tu-16) and its commercial derivative, the *Camel* (Tu-104), the former being the Sov.A.F. designation and the latter being the design bureau designation. A further example of this is the *Bear* which has the official designation Tu-20 and the design bureau designation Tu-95.

Bank: A B-25J-25-NA Mitchell supplied to Russia during W.W.II



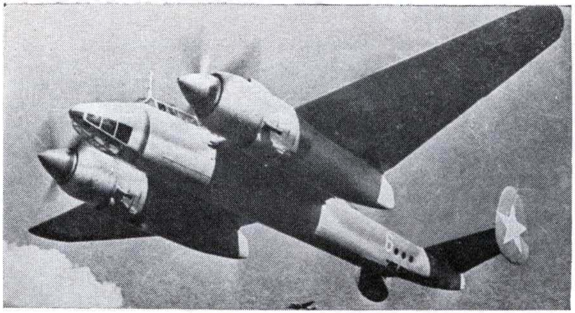


Bark: The initial single-seat production model of the Il-2

Identification of individual designs has been further complicated by the current Soviet practice of bestowing designations intended to hide any relationship to service types on record-breaking aircraft. For instance, the cryptic designations " T431 " and " E66 " applied in 1959 to aircraft establishing new world altitude and speed records are believed to have been intended to conceal the fact that the aircraft concerned were variants of the Sukhoi delta-winged fighters dubbed *Fishbed* and *Fishpot* under the N.A.T.O. designating system.

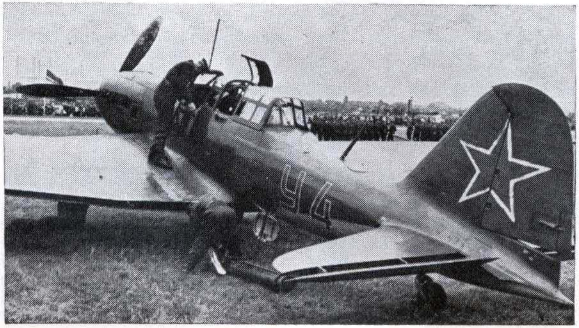
AIRSCREW-DRIVEN BOMBERS AND ATTACK AIRCRAFT

Bank. The code-name *Bank* was applied to the North American Mitchell medium bomber, 862 examples of which reached the U.S.S.R. during the war years from the U.S.A. under Lend-Lease arrangements. Mitchells of the B-25B, C, D, G and J sub-types reached the Soviet Air Forces, and a number of these aircraft remained in service during the immediate post-war years.



Bat: The Tu-2 remained in service with the V.V.S. until 1955–6

Barge. The code-name *Barge* was allocated to an unsuccessful long-range strategic bomber produced by the design bureau headed by V. M. Myasishchev and built in pre-production quantities only. The *Barge*, to which the uncorroborated designation Mi-13 was applied, was of conventional design and was presumably developed as a safeguard against the failure of the more advanced *Bison* and *Bear*. It was powered by four Kuznetsov turboprops.



Beast: An Il-10 of the F.A.'s 200th Ground Attack Division

Bark. Several obsolescent wartime aircraft types which were still serving with second-line units during the immediate post-war years were given code-names, and one such type was the Ilyushin Il-2 which was dubbed *Bark*. The Il-2 was an armoured close-support monoplane of pre-war design first flown in 1938 as the BCh-1. The initial production model was a single-seater and entered service shortly after the German assault on the Soviet Union. Various combinations of armament were tested, and a two-seat conversion training variant, the Il-2U, was evolved. From this the definitive two-seat production model of the Il-2 was developed, the type eventually being succeeded by the Il-10 *Beast*. Most Il-2s were withdrawn from service shortly after the end of World War II.

Bat. The Tu-2, code-named *Bat*, was one of the most successful Russian wartime attack bombers. Designed by A. N. Tupolev, it entered service during the later stages of the war, continuing in service until well into the 'fifties, being supplied to many of Russia's "satellites". Several variants of the Tu-2 were evolved, including a close-support model with a large calibre cannon in a "solid" nose, and the high-altitude Tu-6 with an extended wing and a radar nose. The Tu-2 is no longer in first-line service, but it is likely that a number of aircraft of this type are still flying in the Soviet Union and other communist countries in ancillary rôles.

Bear. The Tupolev Tu-20, alias *Bear*, possesses the distinction of being the only turboprop-powered long-range strategic bomber in the world. A transport adaptation of the bomber is designated Tu-114D, this being used by the Soviet Air Forces for long-range high-speed communications, and major components of the bomber are employed by the commercial Tu-114 (*Cleat*) transport. The *Bear* currently equips a considerable proportion of the *Dalnaya Aviatsiya* strategic bombing squadrons, and is described and illustrated on page 259.

Beast. Designed by Sergei Ilyushin as a result of experience gained with the Il-2 *Bark*, the Il-10, or *Beast*, was developed in 1943, and participated in the closing stages of the war. In its initial production form, the Il-10 was powered by a 1,700 h.p. Mikulin AM-38F engine, entering service at the end of 1944, but in 1946, a new version appeared. Powered by a 2,000 h.p. Mikulin AM-42 engine, the post-war Il-10 remained in service with first-line Soviet close-support units until the late 'fifties, and is believed to be still operated by several of the smaller "satellite" air arms. Its performance includes a maximum speed of 283 m.p.h. at 7,000 ft., a cruising speed of 210 m.p.h., a service ceiling of 21,000 ft., and a maximum range of 671 miles. Armament comprises two 23-mm. cannon and two 7·62-mm. machine-guns firing forward plus one flexible 12·7-mm. gun in the rear cockpit, and a 2,200-lb. bomb load or various air-to-surface rocket missiles may be carried.

Bob. The Ilyushin Il-4 is another obsolete aircraft of World War II to which a code-name was applied. The Il-4, or *Bob*, was derived from the original TsKB-26 experimental bomber flown for the first time in 1935. A developed version, the TsKB-30, attempted to fly from Moscow to New York in April 1939 but made a forced landing in Canada. Previously, in 1938, the TsKB-30 had entered production as the DB-3 long-range bomber, and a refined version of this aircraft, initially known as the DB-3F and subsequently Il-4, was used widely by the Soviet Air Forces and by shore-based elements of the Soviet naval air arm. It is unlikely that any aircraft of this type still exist.

Boot. An experimental three-seat anti-submarine aircraft of unknown design origin, the *Boot* was displayed at Kubinko airfield near Moscow in 1956. Powered by a 4,000 e.s.h.p. Kuznetsov turboprop driving contraprops, the *Boot* carried three small torpedoes, but it would seem that development of this type has been abandoned, and there is no evidence that it entered service with the A.-V.M.F.

Box. The code-name *Box* was applied to the Douglas A-20 Havoc, 2,908 examples of which reached the U.S.S.R. from the U.S.A. under Lend-Lease, nearly half of the total A-20 production. Variants supplied to Russia included 151 DB-7Bs and DB-7Cs built to British contracts, the others being A-20B, C, G, H, and K sub-types. The A-20s were mostly withdrawn from service shortly after the termination of hostilities, although some remained until the late 'forties in second-line rôles.

Buck. The Petlyakov Pe-2, or *Buck*, designed by Vladimir M. Petlyakov as a three-seat close-support bomber, entered service during 1941, and was one of the most successful of Russian wartime aircraft. It also served in the night fighter rôle, and several versions were produced in quantity, these differing principally in defensive armament. A training version, the Pe-2U with tandem cockpits, was also evolved, and various models of the Pe-2 remained in service with the Soviet " satellite " air forces until the early 'fifties. Although no longer in first-line service, the Pe-2 is still believed to be flying in small numbers, primarily in the training rôle. It is powered by two 1,100 h.p. Klimov VK-105R liquid-cooled engines and has a maximum speed of 340 m.p.h. at 16,500 ft. Range is 1,200 miles, and empty and maximum loaded weights are 12,900 lb. and 18,730 lb. respectively.

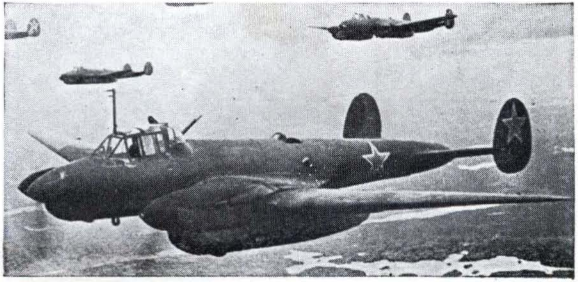
Blowlamp: Development of this type has been abandoned.

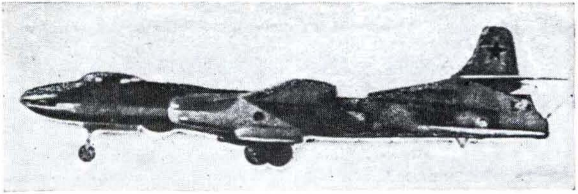
Bull. The *Bull*, or Tu-4, was derived from the Boeing B-29 Superfortress by A. N. Tupolev's design bureau, three Superfortresses having landed in Soviet territory in 1944, these being annexed by the Russians. Although externally indistinguishable from the Superfortress, the Tu-4 was, according to official Russian figures, lighter than the American bomber, weighing 104,940 lb., and its 2,000 h.p. Shvetsov ASh-73TK engines were copies of the Wright R-3350. Service ceiling was claimed to be 36,745 ft., some 3,000 ft. greater than that of the Superfortress, and performance of U.S. and Russian built models was closely comparable, the less powerful Shvetsov engines being compensated by the reduced loaded weight. A considerable number of Tu-4s are still flying, serving principally as transports and for maritime reconnaissance duties.

TURBOJET-DRIVEN BOMBERS AND ATTACK AIRCRAFT

Backfin. Reportedly now entering service with the Soviet Air Forces as a supersonic successor to the Il-28 (*Beagle*), the

Buck: A few Pe-2s reportedly still serve in training rôles





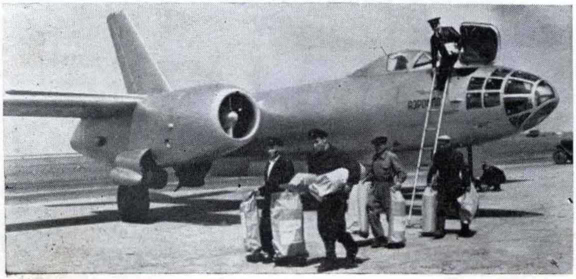
Bosun: The Tu-14 was employed exclusively by the A.-V.M.F.

Backfin was flown for the first time in 1956 and has been designed by Alexander S. Yakovlev's team. Designated Yak-42, this aircraft was first observed in service in 1958. It is described and illustrated on page 222.

Badger. Currently the standard Soviet long-range medium bomber, the *Badger* is being supplemented and will presumably be replaced by the supersonic *Bounder*. The *Badger*, or Tu-16, was developed by one of the design bureaux headed by A. N. Tupolev, and began to enter service with the *Dalnaya Aviatsiya* in 1954. This bomber is described and illustrated on page 220.

Beagle. The first light jet bomber to enter service in large numbers with the *Frontovaia Aviatsiya*, the *Beagle*, or Ilyushin Il-28 has also been supplied to the air forces of Afghanistan, China, Czechoslovakia, Indonesia, Poland and the United Arab Republic. Flown for the first time in 1948, the Il-28 equips most Soviet light bomber units, and several have been used by *Aeroflot* for experimental mail services under the designation Il-20. The Il-28 is described and illustrated on page 202.

Beagle: A demilitarised Il-28 (alias Il-20) with Aeroflot



Bison. The *Bison*, together with the turboprop-driven *Bear*, currently equips most *Dalnaya Aviatsiya* strategic bombing units. Produced by V. M. Myasishchev's design bureau which previously produced the *Barge*, the *Bison* is comparable with the B-52 Stratofortress and is described and illustrated on page 215.

Blowlamp. Believed to have been designed by S. V. Ilyushin, the *Blowlamp* three-seat supersonic light bomber was shown to a western aeronautical delegation at Kubinko, near Moscow, in June 1956, but since that time nothing further has been heard of this type, and it may be presumed that development has been abandoned. The *Blowlamp* was reportedly powered by two 18,000–20,000 lb.s.t. Mikulin M-209 turbojets with which a maximum speed of 907 m.p.h. (Mach 1·37) was attained at 39,500 ft. Empty and loaded weights have been quoted as 34,000 lb. and 65,000 lb. respectively, cruising speed was approximately Mach 0·92, and radius of action was 745 miles at 40,000 ft. and 360 miles at 5,000–10,000 ft.

Bosun. The Tupolev Tu-14, or *Bosun*, was the first jet bomber designed by A. N. Tupolev's bureau to be manufactured in substantial numbers. Tupolev's first jet bomber, which bore the design bureau designation Tu-77, was a conversion of the piston-engined Tu-2 with two 2,000 lb.s.t. RD-10 turbojets. This was followed by the experimental Tu-82 which, flown in February 1949, was the first swept-wing Soviet jet bomber. A production development of the Tu-77, powered by two 4,400 lb.s.t. turbojets and flown for the first time in 1947, received the Sov.A.F. designation Tu-12, but this was built in small numbers only, and the Tu-14, which first flew in 1949, was the first of Tupolev's series of twin-jet bombers to be built in comparatively large numbers. The Tu-14 five-seat light bomber entered service with the A.-V.M.F. during the early 'fifties and is now believed to have been withdrawn from first-line service. Powered by two 5,950 lb.s.t. Klimov VK-1 turbojets, the Tu-14 had an approximate maximum speed of 520 m.p.h. (Mach 0·79) at 36,000 ft., and a range with maximum warload of some 2,000 miles.

Bounder. The *Bounder*, the design origin of which is uncertain, is known to be in operational service with the *Dalnaya Aviatsiya* and exists in at least six versions, one of which is a missile launching platform. It is possible that the *Bounder* is both the " 103-M " which established seven speed-with-payload records and the " 201-M " which established seven payload-to-height records in 1959. The *Bounder* is described and illustrated on page 231.

Brawny. The *Brawny* twin-jet close-support aircraft appeared at Kubinko in 1956 and was presumably designed as a successor to the piston-engined Il-10 *Beast*. However, no reports of the *Brawny* have been received since 1956, and it may be presumed that development has been abandoned. The design origin of the *Brawny* is unknown.

AIRSCREW-DRIVEN FIGHTERS AND FIGHTER-BOMBERS

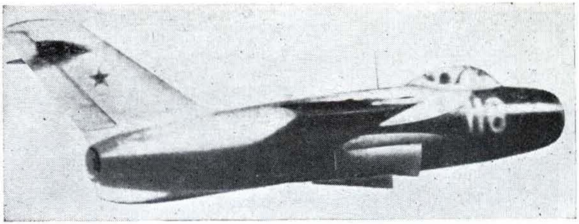
Fang. The code-name *Fang* was allocated to the Lavochkin-designed La-11 single-seat fighter powered by the 1,850 h.p. Shvetsov ASh-82FNV radial and a post-war development of the La-9 (*Fritz*). The La-11 equipped many *Frontovaia Aviatsiya* squadrons until the advent of the MiG-15 (*Fagot*) jet fighter in the late 'forties. It was also supplied to the Sino-Communists and the North Koreans who used the La-11 to a limited extent during the Korean War. The La-11 was phased out of service with the F.A. in 1949–50.

Fin. Although the La-7 had been largely supplanted by later fighters when the N.A.T.O. system of code-names was conceived, this obsolete type was dubbed *Fin*. The La-7 appeared in 1943 and was flown operationally during the closing stages of the war. It was essentially a refined, more powerful development of the La-5FN, and a tandem two-seat training variant was designated La-7U, this remaining in service until the early 'fifties.

Frank. Several post-war production variants of the Yak-9 single-seat fighter-bomber served with the Soviet Air Forces and with the air arms of Russia's " satellites " until the mid 'fifties. Powered by the 1,650 h.p. Klimov VK-107A engine, the principal post-war variants were the Yak-9U and Yak-9P which were dubbed *Frank*. The Yak-9U actually appeared during the later stages of the war but was too late to see operational service. The Yak-9P was supplied to the North Koreans and saw some operational service during the Korean conflict.

Fred. In view of the very large numbers of Bell P-63 Kingcobra fighters supplied under Lend-Lease to the U.S.S.R. during the war years, it was logical to suppose that some of these would remain in service with the Soviet Air Forces, and it was therefore allocated the code-name *Fred*. Actually, 2,400 Kingcobras were delivered to Russia, more than two-thirds of the total production, but these appear to have been withdrawn shortly after the termination of hostilities.

Fritz. The final wartime development of Semyon Lavochkin's series of single-seat fighters, the *Fritz*, or La-9, actually bore little design relationship to the earlier La-5FN and La-7. Deliveries began shortly before the cessation of hostilities, and the La-9 was widely used by the Soviet Air Forces in the years immediately following the war. Some fighters of this type were fitted with rocket motors and impulse ducts for power-boosting purposes.

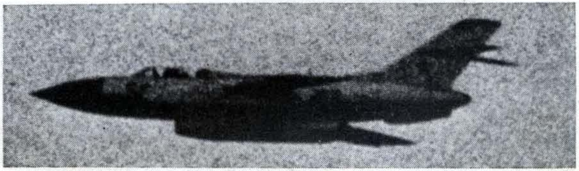


Fantail: The La-15 was built in only limited quantities

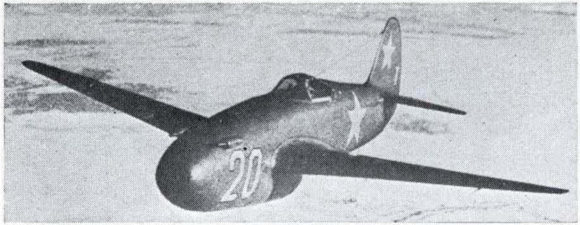
JET FIGHTERS AND FIGHTER-BOMBERS

Faceplate. The *Faceplate*, or MiG-21, is Russia's first interceptor fighter capable of level speeds in excess of Mach 2·0 to attain widespread service. The MiG-21 has been supplied to East Germany and China, and equips many I.A.-P.V.O. units. It is described and illustrated on page 214.

Fagot. Flown for the first time on December 30, 1947, the MiG-15 or *Fagot* did more than any other warplane to bring Soviet combat aircraft design to world standard. Several variants of the MiG-15 were built before it was phased out of production in the Soviet Union in 1953–4, and it has been built under licence in Czechoslovakia as the S-102 with the RD-45 engine and S-103 with the VK-1 engine. Similar models built in Poland were designated LIM-1 and LIM-2.



Flashlight-C: One of two Yak-25 variants that appeared in 1956



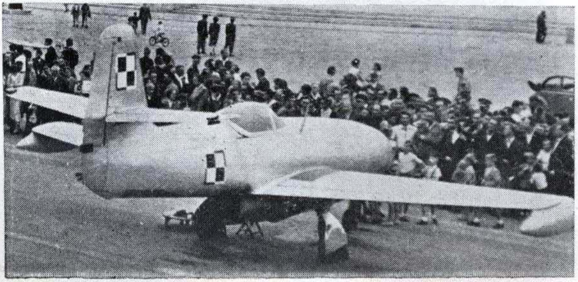
Feather: Both Yak-15 (above) and Yak-17 were dubbed " Feather "

The MiG-15 is still widely used but primarily in the close-support rôle. It is described and illustrated on page 213.

Fantail. Developed in parallel with the MiG-15, the La-15, or *Fantail*, was built in relatively small quantities, flying in prototype form at approximately the same time as the prototype MiG-15. Powered by a 3,500 lb.s.t. RD-500 turbojet, the La-15 was unusual in featuring a shoulder-mounted wing which was swept 37° 20′ at the leading edge. It carried an armament of two 23-mm. cannon and, according to Russian sources, attained a maximum speed of Mach 0·92 (617–700 m.p.h.). It is unlikely that any fighters of this type still exist.

Fargo. One of Russia's " first generation " jet fighters, the MiG-9, dubbed *Fargo*, was flown in prototype form for the first time on April 24, 1946, the same day as the Yak-15 was first tested. Powered by two RD-20 turbojets in the forward fuselage, the MiG-9 attained, according to official Russian sources, a maximum speed of 565 m.p.h. and a ceiling of 42,650 ft. Its loaded weight was 11,177 lb. Like the Yak-15, the MiG-9 was evidently viewed as an interim fighter until more advanced designs were proven, and was built in comparatively small numbers.

Flora: A Yak-23 fighter in Polish Air Force insignia



Farmer. The first Soviet production interceptor fighter capable of maintaining speeds in excess of Mach 1·0, the MiG-19, or *Farmer*, first flew in 1953, entering service two years later. The initial production model powered by twin AM-5 engines was dubbed *Farmer-A*. The *Farmer-B* differs in having AM-9b engines and Scan ODD interception radar, while the *Farmer-C* has larger wing-root cannon. The MiG-19 is described and illustrated on page 214.

Feather. The code-name *Feather* was allocated to the Yak-17 which was essentially a progressive development of the Yak-15, Alexander Yakovlev's first jet fighter. The Yak-15 employed many components of the Yak-3 piston-engined fighter, and first flew on April 24, 1946. It was powered by a 1,980 lb.s.t. RD-10 turbojet with which it attained a maximum speed of approximately 495 m.p.h. at 9,840 ft. The Yak-15 was unusual in featuring a tailwheel undercarriage, and the Yak-17, which began to enter service at the beginning of 1948, differed principally in having a nosewheel, the main undercarriage members being transferred from the forward wing spar to a reinforced rear spar. The Yak-17 also featured redesigned tail surfaces and an RD-10A turbojet of 2,200 lb.s.t. Its maximum speed was 510 m.p.h. at 9,840 ft.

Fishbed. The *Fishbed* single-seat supersonic interceptor fighter was developed by a design bureau headed by Pavel O. Sukhoi, a former member of Alexander Tupolev's design team. Since the end of World War II, Sukhoi has been actively engaged in the development of jet fighters, his first design being the Su-9, a twin-jet fighter bearing a resemblance to the Messerschmitt Me 262. Flown in 1947, the Su-9 attained a maximum speed of 559 m.p.h. and weighed 12,760 lb. It employed rockets to assist take-off and was fitted with a parabrake. The Su-15, which appeared in 1948, was powered by two 4,400 lb.s.t. turbojets which were mounted side-by-side in the forward fuselage, and attained a maximum speed of 712 m.p.h. It carried limited all-weather radar in a cone over the nose air intake. Sukhoi's next fighter prototype, the Su-17, which appeared in 1949, was claimed to be Russia's first combat aircraft capable of exceeding Mach 1·0 in level flight. It embodied several advanced features, including a pressurised jettisonable capsule which housed the pilot, but it failed to attain production. The *Fishbed*, the Soviet designation of which is not known, was revealed at Tushino in 1956. At that time, two variants of the basic design were displayed, the *Fishbed-A* with pointed wingtips and the *Fishbed-B* with clipped wingtips. There have since been no reports of this delta-wing fighter having entered service, and it may be presumed to have progressed no further than the experimental stage.

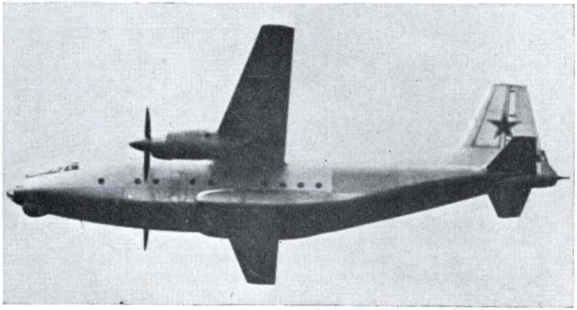
Fishpot. Displayed at the same time as the *Fishbed* and the product of the same design team, the *Fishpot* has now entered service with the Soviet Air Forces and is illustrated and described on page 236. It is believed that a variant of the *Fishpot*, labelled " E66 ", was responsible for establishing a new world absolute altitude record of 112,205 ft. on April 28, 1961.

Fitter. Another fighter demonstrated at Tushino in 1956, the *Fitter* does not appear to have progressed further than the prototype stage. Featuring a 57° swept wing with straight inboard trailing edge sections, the *Fitter* appeared to share a common fuselage with the *Fishbed*, and may be presumed, therefore, to have been a Sukhoi design.

Flashlight. Extensively employed by the I.A.-P.V.O. night and all-weather interceptor squadrons, the Yak-25 is dubbed *Flashlight-A* and is characterised by the large, bulbous dielectric nose housing for the PD-6 interception radar. The Yak-25 entered service with the I.A.-P.V.O. in 1955, and is described and illustrated on page 229. Two developments of the basic design, the service status of which is uncertain, are known as the *Flashlight-B* and *Flashlight-C*, and made their public début at Tushino on June 24, 1956. Afterburning turbojets each offer 9,810 lb. thrust, these being Kuznetsov units essentially similar to the 7,936 lb.s.t. non-afterburning units of the *Flashlight-A*, and various aerodynamic refinements are incorporated, the inboard wing leading edges being extended to improve critical Mach number, and the cockpit contours being improved. The *Flashlight-B* features a pointed, glazed nose and a single-seat cockpit, presumably being intended for the light reconnaissance-bomber rôle, and the *Flashlight-C* has a two-seat cockpit with a sharply pointed nose radome. Estimated performance of the latter includes a maximum speed of 770 m.p.h., or approximately Mach 1·0, at sea level, a maximum cruising speed of 640 m.p.h. at 22,965 ft., a service ceiling of 57,700 ft., and a maximum range of 1,490 miles.

Flora. First flown in 1947, the Yak-23, or *Flora*, was a relatively conventional fighter developed as a safeguard against the failure of the more advanced MiG-15 and La-15. Powered by a 3,500 lb.s.t. RD-500 turbojet, the Yak-23 carried an armament of two 23-mm. cannon and, according to official Russian figures, attained a maximum speed of 568 m.p.h., an initial climb rate of 6,690 ft./min., and a ceiling of 48,550 ft. Endurance with wingtip auxiliary tanks was two hours, and empty and normal loaded weights were 4,410 lb. and 7,365 lb. A small number of Yak-23 fighters were supplied to the Polish Air Force, but no aircraft of this type are now in service.

Fresco. Although bearing an overall resemblance to its predecessor, the MiG-15 (*Fagot*), the MiG-17, or *Fresco*, was, in fact, an entirely new design, the original production version of which, the *Fresco-A*, was beginning to supplant the MiG-15 in 1954. The *Fresco-B* differed from the initial model primarily in having rectangular air brakes situated immediately aft of the wings, but the principal production model, the *Fresco-C*, embodied some redesign of the rear fuselage which incorporated a short afterburner. The *Fresco-D* was fitted with Scan ODD interception radar, and the *Fresco-E* was generally similar apart from having the afterburner eliminated. The MiG-17 is described and illustrated on page 214.

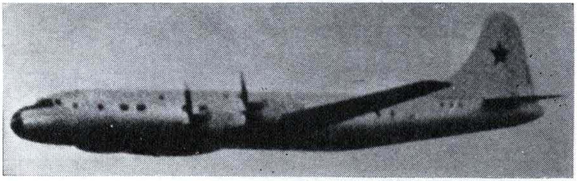


Camp: The An-8 reportedly failed to pass evaluation trials

AIRSCREW-DRIVEN TRANSPORTS AND LIAISON AIRCRAFT.

Cab. The code-name *Cab* was allocated to the Russian-built version of the Douglas DC-3 which, in the U.S.S.R., is designated Li-2. A Russian engineer, Boris Lisunov, was sent to Douglas Aircraft shortly before World War II, and a manufacturing licence for the DC-3 was obtained. The Russian Li-2 differed from the DC-3 principally in having a starboard rear entry door. Some Li-2s were fitted with a manually-operated gun turret over the radio compartment, and cold-weather cowlings were frequently fitted for the M-62 engines. Many hundred Li-2s were manufactured in Russia during the war years and, in addition, 708 Douglas C-47 transports were received by the Russians under Lend-Lease. Both Li-2s and American-built C-47s are still flying in substantial numbers in the Soviet Union.

Camp. Possessing the design bureau designation An-8, the *Camp* was designed during the winter of 1952–3 as a commercial freight and passenger transport for use from short airstrips in Siberia and the Far East. The prototype was completed as a military assault transport, however, and was displayed publicly in June 1956 at Tushino. Since this time, nothing further has been heard of the An-8, and it would seem unlikely that this transport entered production. The An-8 was powered by two 5,100 e.h.p. Kuznetsov turboprops and featured a rear ramp to facilitate the loading of bulky freight.



Cart: An experimental transport derivative of the Tu-4 (B-29)

Cart. Shortly after the Tu-4 (*Bull*) long-range strategic bomber had been placed in production, A. N. Tupolev's design team evolved a civil and military transport version in which an entirely new fuselage was married to the wings, tail surfaces, and undercarriage of the bomber. Possessing the design bureau designation Tu-70 and dubbed *Cart* under the N.A.T.O. naming system, the transport was not entirely successful, and only a few prototypes were built. According to official Russian figures, the Tu-70 powered by four 2,000 h.p. Shvetsov ASh-73TK engines had a loaded weight of 113,318 lb., carried a crew of eight and forty-eight passengers, and flew for the first time late in 1946. Its performance included a maximum speed of 350 m.p.h., a maximum range of 3,045 miles, and a ceiling of 33,465 ft.

Cat. The code-name *Cat* is applied to all versions of the basic An-10 Ukraina transport which include the 84-passenger An-10 and 100-passenger An-10A commercial models, and the An-12 military transport. A projected 130-passenger commercial version is designated An-16. The An-12, which is now in service with the A.-V.D.V., features a redesigned rear fuselage incorporating a rear-loading ramp, revised tail surfaces, and a tail gun turret. An-12 transports have been purchased for the Indian Air Force and supplied as a gift to the Ghana Air Force. The *Cat* is described and illustrated on page 242.

Clam. The first post-war Russian four-engined transport of entirely indigenous design was the *Clam* which was flown for the first time in 1947. Designated Il-18 (a designation applied a number of years later to the *Coot*, the second four-engined commercial transport from S. V. Ilyushin's design bureau), the transport was built in prototype form only. It provided accommodation for sixty passengers and six crew members, and was powered by four Shvetsov ASh-73TK engines of 2,000 h.p. Performance included a maximum speed of 365 m.p.h., a maximum cruising speed of 310 m.p.h., a ceiling of 35,145 ft., and a maximum range of 3,853 miles.

Cleat. Currently the world's largest commercial transport, the *Cleat*, or Tu-114, entered service with *Aeroflot* late in 1960. Derived from the Tu-20 (*Bear*), alias Tu-95, the Tu-114 retains the wings, tail assembly, undercarriage and other components of the bomber, and was first flown in the autumn of 1957, but teething troubles delayed its service introduction. A direct conversion of the Tu-20 bomber for long-range transport duties is designated Tu-114D. This is intended to carry a small number of passengers, mail and urgent freight over very long distances, and is reported to have a loaded weight of 268,800 lb. In 1958, the prototype Tu-114D flew the 5,280 miles between Moscow and Irkutsk and back again non-stop at an average speed of 497 m.p.h. The Tu-114 is described and illustrated on page 259.

Clod. The code-name *Clod* has been allocated to the small An-14 Ptchelka light utility transport, the first of two prototypes of which flew on March 15, 1958. Quantity production began late in 1959, and the type is being used for forestry patrol and in agricultural rôles. It is likely that the An-14 will be adopted by the Soviet Air Forces as a successor to the An-2 (*Colt*). The An-14 is described and illustrated on page 267.

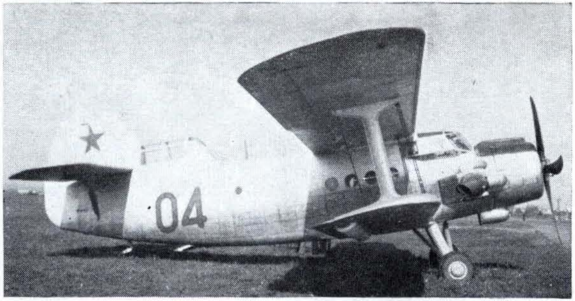
Coach. Russia's first post-war transport, the *Coach*, or Il-12, was flown for the first time in 1946, and was subsequently built in large quantities for the transport elements of the Soviet Air Forces, for *Aeroflot* and several other airlines, including C.S.A. and L.O.T. The Il-12 was supplanted in production by the Il-14 (*Crate*) during 1952–3, but many aircraft of this type are still flying, and it is described and illustrated on page 289.

Colt. The Antonov An-2, or *Colt*, was originally designed for agricultural duties under the designation SKh-1, and the prototype flew for the first time in 1947. The prototype and early production machines were powered by the 630 h.p. ASh-21 engine, but subsequently the more powerful ASh-621R engine was adopted, and several thousand aircraft of this type have since been produced for both the Soviet Air Forces and for civil organisations. The An-2V has twin metal floats with pneumatically-operated water rudders and a manually-operated winch, and the An-2ZA was a high-altitude meteorological research variant with a turbo-supercharger and an extra cockpit immediately forward of the tail assembly. A night artillery observation and reconnaissance variant with twin fins and rudders and a manually-operated tail turret was built in prototype form as the NRK. The An-2 is described and illustrated on page 300.

Coot. The designation Il-18, originally applied in 1947 to the unsuccessful *Clam*, was resurrected in mid-1957 when the turboprop-driven *Coot* flew for the first time. The first pre-production Il-18 transports were delivered to *Aeroflot* for route-proving trials in 1958, and the transport has since been exported to a number of foreign airlines. Known as the Moskva, the Il-18 is described and illustrated on page 255.

Crate. Derived from the Il-12 (*Coach*), the Il-14, or *Crate*, has been produced in several versions for the Soviet Air Forces, for *Aeroflot*, and for export. It has also been manufactured under licence in Czechoslovakia by the Georgi Dimitrov works at Letnany, Czech versions including the Avia-14-32A and the Avia-14 Super, the latter having a reduced empty weight and increased passenger accommodation, as well as improved ASh-82T engines of 1,900 h.p. The principal Russian production versions were the Il-14P and Il-14M, the latter having a lengthened fuselage and increased capacity. The Il-14 is extensively used by the A.-V.D.V., and is also used by the air arms of China, Czechoslovakia, East Germany, the United Arab Republic, the Congolese Republic, Indonesia, Poland and Yugoslavia. The Il-14 is described and illustrated on page 290.

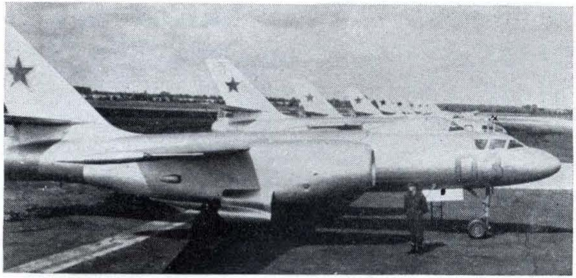
Creek. Designed originally in 1944 as a light three-seat liaison monoplane, the *Creek*, or Yak-12, was initially powered by the 145 h.p. M-11D or M-11FR engine, and it was built in relatively small numbers until 1952 when it was fitted with an Ivchenko AI-14R engine as the Yak-12R (*Creek-B*). The greatly improved performance resulted in large-scale production, and in 1954, the Yak-12R was supplanted by the Yak-12M (*Creek-C*) in which mixed construction gave place to all-metal construction. In 1957, a further development, the Yak-12A (*Creek-D*), appeared, this being a four-seater with an entirely redesigned wing. The Yak-12M has been manufactured under licence in Poland. The Yak-12A is described and illustrated on page 348.



Colt: The An-2ZA (An-4) meteorological research version of An-2

Crow. The code-name *Crow* was applied to a parallel development of the Yak-12, the low-wing Yak-10 two-seat cabin monoplane of wooden construction powered by a 160 h.p. Shvetsov M-11 engine. The Yak-10 (originally thought to be the Yak-14) was not successful, and only a prototype was completed.

Mascot: Il-28U trainer of the V.V.S.'s 221st Air Division



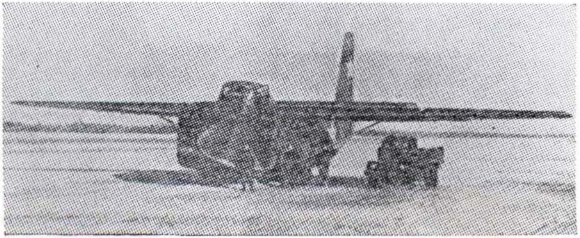
Midget: The MiG-15UTI trainer version of the MiG-15 fighter

JET TRANSPORTS

Camel. Russia's first jet transport to enter service, the Tu-104 or *Camel* was derived from the Tu-16 (*Badger*) medium bomber, employing an essentially similar wing, undercarriage and tail assembly. First flown on June 17, 1955, the Tu-104 entered service with *Aeroflot* fourteen months later, the initial model providing accommodation for fifty passengers. The Tu-104A was basically similar but had up-rated Mikulin turbojets and an alternative interior arrangement providing accommodation for seventy passengers, and the Tu-104B which entered service in the spring of 1959 had a slightly lengthened fuselage with accommodation for one hundred passengers. A further variant of the basic design, the Tu-104E, established several speed-with-payload records on April 2, 1960. The Tu-104 is described and illustrated on page 220.

Cooker. The Tu-110, or *Cooker*, was derived from the Tu-104 and first appeared in 1957, at which time it was claimed to provide greater economy and range than the earlier transport. Powered by four 11,750–12,860 lb.s.t. Lyulka turbojets, the Tu-110 attained a maximum speed of 620 m.p.h. at 32,800–39,400 ft. (Mach 0·94), an economical cruising speed of 497 m.p.h. at 39,370 ft. (Mach 0·757), and a range of 1,988 miles with a 26,455-lb. payload and one hour's reserves. As a result of the success of the 100-seat Tu-104B (*Camel*) development of the Tu-110 was abandoned.

Mare: The Yak-14 transport glider entered service in 1950–51



HELICOPTERS

Hare. The *Hare*, or Mil Mi-1, has been in continuous production for more than ten years, and is extensively used in the U.S.S.R. Several versions of the Mi-1 have been produced, including the Mi-1U trainer, the Mi-1NKh multi-purpose model, and the Moskvich, the last-mentioned version being evolved in 1960 and featuring all-metal rotor blades, hydraulic controls and a noise-insulated cabin. The Mi-1 is manufactured under licence in Poland as the SM-1, and has been exported to several foreign countries. The Mi-1 is described and illustrated on page 153.

Hen. Designed by Nikolai N. Kamov who has been associated with rotorcraft development since the late 'twenties, the Ka-15, or *Hen*, two-seat utility helicopter was the first of his designs to be manufactured in large numbers. The Ka-15 is used by State Collective Farms and, with two external panniers as the Ka-15M, by *Aeroflot*. It has also been supplied to the Soviet Navy, by which service it is used as a shipboard anti-submarine helicopter. The Ka-15 is described and illustrated on page 152.

Hog. A four-seat development of the Ka-15 (*Hen*), the Ka-18, or *Hog*, appeared in 1957. Apart from the forward fuselage, it is virtually identical to the Ka-15, and during 1959 the Ka-18 raised the 500-km. closed-circuit speed record for helicopters in its class to 105·8 m.p.h. The Ka-18 is illustrated and described on page 152.

Hook. The Mi-6, or *Hook*, possesses the distinction of being the world's largest helicopter. Powered by shaft turbines and capable of accommodating up to 120 passengers, the Mi-6 has established a number of world records and was expected to enter service in Siberia during the course of 1961. The Mi-6 is described and illustrated on page 154.

Horse. The first helicopter designed by Alexander Yakovlev's bureau to be manufactured in quantity, the *Horse*, or Yak-24, was designed to meet an official specification for a military assault transport, design being initiated in the summer of 1952. Prior to this, the Yakovlev design bureau had produced a small three-seat helicopter which, closely resembling the Sikorsky S-51, bore the factory designation Yak-100. This did not progress further than the experimental stage. Utilising Mi-4 rotor heads and blades, the first of three Yak-24 prototypes flew in 1953, and quantity production began the following year. Several versions of the Yak-24 have been developed for military and civil applications, the latest being the Yak-24K which, announced in 1960, is a luxury commercial model for nine passengers. The Yak-24 is described and illustrated on page 167.

Hound. More than a thousand Mi-4, or *Hound*, helicopters have been manufactured in the U.S.S.R. since this type entered production at the end of 1952. The basic military version of the Mi-4 has a ventral gondola for the navigator, and this model has been supplied to many foreign air forces, and commercial variants include the 8–11 passenger Mi-4P which serves with *Aeroflot*, and the agricultural Mi-4S. The Mi-4 is described and illustrated on page 154.

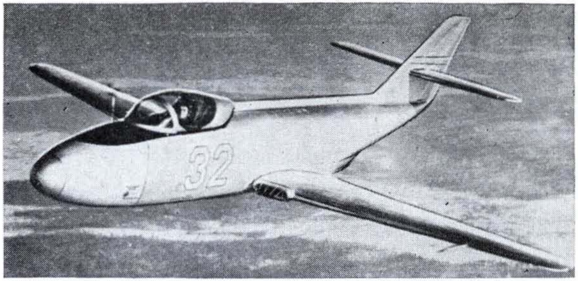
MISCELLANEOUS AIRSCREW-DRIVEN TYPES AND TRANSPORT GLIDERS

Madge. The only Russian military post-war flying boat to have been built in quantity, the Beriev Be-6 was allocated the N.A.T.O. code-name *Madge*, and although still used in small numbers by the A.-V.M.F. for maritime reconnaissance and transport duties, it has now been relegated largely to fishery patrol duties. Designed by G. M. Beriev, the Be-6 is described and illustrated on page 262.

Mare. The Soviet Union continued with the development of large assault gliders long after these had been abandoned by other nations, and in 1949 the Yak-14, or *Mare*, made its appearance. Possessing some resemblance to the wartime Hamilcar glider, the Yak-14 featured a folding nose section and a cockpit offset to the port side. Its approximate dimensions included a wing span of 85 ft., and an overall length of 59 ft. 6 in. The Yak-14 was built in series and was usually towed by the Il-12 (*Coach*), remaining in service with the A.-V.D.V. until the late 'fifties.

Mark. The Yak-7U, or *Mark*, was a wartime tandem two-seat development of the Yak-1M single-seat fighter. Initially known as the UTI-26, the first production model of the Yak-7U did not feature the cut-down rear fuselage of the definitive production model. The Yak-7U was used for both conversion training and liaison, but disappeared from service in the late 'forties.

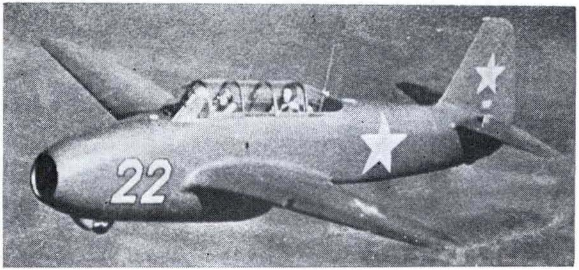
Max. Designed to succeed the UT-2 (*Mink*) primary trainer, the Yak-18, or *Max*, was introduced in 1946 and has been progressively developed during the past fifteen years. The original Yak-18 was powered by the 160 h.p. M-11FR engine, and was produced in large numbers to equip the military and civil flying training schools. It was also supplied to most communist air arms and to the air forces of Austria and the United Arab Republic. The first modified version was the Yak-18U with a slightly lengthened fuselage and a semi-retractable nosewheel undercarriage. A fully aerobatic single-seat model, the Yak-18P, with a 260 h.p. AI-14R engine followed, a two-seat version with this engine being designated Yak-18A. Both the Yak-18P and Yak-18A have semi-retractable nosewheel undercarriages, the main members of which retract forward. A further development, the Yak-20, featured a fully retractable undercarriage, but this variant has now been abandoned. The Yak-18 is described and illustrated on page 319.



Not allocated a code-name at the time of closing for press, the Yak-32 has a small Fumanskii turbojet and weighs 4,710 lb. It established a Class C., Group 1 sub-class C.1d altitude record of 47,080 ft. on February 22, 1961. It is a two-seat trainer

Mink. During 1935–6, Yakovlev's AIR-10 was adopted as the standard Soviet Air Force primary trainer under the designation UT-2. Powered by an M-11D of 125 h.p. or an M-11G of 110 h.p., the UT-2 was built in very large quantities throughout the war years and was subsequently supplied to many "satellite" air forces, remaining in service until supplanted by the Yak-18. Under the N.A.T.O. system, the UT-2 was named *Mink*.

Mist. The code-name *Mist* was allocated to a troop-carrying glider designed by Tsibin and produced in the late 'forties. It is not believed that the *Mist* progressed further than the experimental stage.



Magnet: Russia's first jet conversion trainer, the Yak-17UTI

Mole. The *Mole*, or Beriev Be-8, was flown for the first time in 1951, and was evidently intended to succeed the Be-6 (*Madge*) in service with the A.-V.M.F. Powered by two Klimov VK-1 turbojets, this gull-winged maritime reconnaissance flying boat did not progress further than the prototype stage. It is believed to have had a maximum speed of the order of 420 m.p.h. It should be noted that, although the *Mole* was not an airscrew-driven type its identification name possessed only one syllable.

Moose. Developed by Alexander Yakovlev shortly after the war, the *Moose*, or Yak-11 (this designation is an exception to the general rule in that odd numbers had previously been allocated only to fighters by the Sov.A.F.), is a basic trainer widely used by the Soviet Air Forces and exported to many countries. With a nosewheel undercarriage it is designated Yak-11U, and Czech-built versions are designated C.11 and C.11U. The Yak-11 is described and illustrated on page 318.

Mop. The code-name *Mop* was allocated to the Russian-built version of the Consolidated PBY-1 which entered production at Taganrog in 1938 under the designation GST. Russian production of the GST was supplemented during the war years by the delivery under Lend-Lease of 137 PBN-1s and forty-eight PBY-6As, and examples of both the Russian- and American-built versions of the basic Consolidated design are still flying in the Soviet Union on fishery patrol and transport duties.

Mote. The Beriev Be-2, or *Mote*, was flown for the first time in 1932 and, with a single 680 h.p. M-17 engine, entered production as a short-range reconnaissance flying boat designated MBR-2. An 860 h.p. AM-34 engine was later installed, and the type was redesignated Be-2 in 1942. Used extensively in the Black Sea, the Be-2 was used for fishery patrol duties during the immediate post-war years.

Mug. The Beriev Be-4, or *Mug*, entered service with the Soviet Navy in 1938–9 under the designation MDR-6. Carrying a crew of five, it was a long-range reconnaissance bombing flying boat powered by two 1,100 h.p. M-63 engines with which it attained a maximum speed of 193 m.p.h. It is extremely unlikely that any Be-4 flying boats remain in service.

Mule. The Polikarpov Po-2 primary training and utility biplane, dubbed *Mule*, was conceived in 1924 and flown for the first time in 1927 under the designation U-2. The aircraft remained in production for seventeen years, many thousands being built. Many Po-2s are flying in the Soviet Union and other communist countries, being used as club trainers and glider tugs, and the type has been manufactured in some numbers in Poland as the C.S.S.13, some ambulance versions having an enclosed cabin. The Po-2 is described and illustrated on page 303.

JET TRAINERS

Magnet. Russia's first tandem two-seat jet conversion trainer, the *Magnet*, or Yak-17UTI, was developed from the Yak-17 single-seat fighter and entered service in 1948. One aircraft of this type was supplied to the Polish Aero Club to provide Polish reserve pilots with jet experience, but the type was supplanted in service during the early 'fifties by the MiG-15UTI (*Midget*).

Mascot. A training version of the Il-28 (*Beagle*) light bomber, the Il-28U, or *Mascot*, features a second cockpit ahead of the normal cockpit and is used primarily for conversion training. The glazed nose and ventral radome are deleted. The Il-28U is illustrated on page 85.

Midget. A tandem two-seat conversion trainer variant of the MiG-15 single-seat fighter, the MiG-15UTI, or *Midget*, has been built under licence in Czechoslovakia and in Poland as the LIM-3. In addition to being supplied to most communist air forces, the MiG-15UTI also serves with the air arms of Cuba, Morocco, Afghanistan, Indonesia and the United Arab Republic. The MiG-15UTI is illustrated on page 86, and is also shown in Indonesian service on page 34.

ADEN AIRWAYS LTD. A wholly-owned subsidiary of B.O.A.C., Aden Airways flies an important network of routes connecting with B.O.A.C. services, covering Nairobi, Mombasa, Bahrain, Asmara, Hargeisa (Somaliland), Djibouti, Khartoum and other points. Its fleet comprises seven Douglas DC-3s and three ex-B.O.A.C. Canadair Argonauts. Three Avro 748s are on order, Aden Airways being the first to specify the Series 2 version of this design.

Address: Khormaksar, Aden, Arabia.

AER LINGUS. This Irish airline operates services from Dublin to points in the U.K. and throughout Europe. B.E.A. has a small interest, the remainder of the shares being held by the Government-owned holding company, Aer Rianta. Aer Lingus was one of the first airlines to become all-turbine equipped, when it added seven Fokker F-27s to its seven Vickers Viscount 808s. Five Douglas DC-3s are retained for charters and extra services.

Address: 43 Upper O'Connell Street, Dublin, Eire.

AERLINTE EIREANN. See Irish International Airlines.

AERO CHACO. Two de Havilland Beavers are used by this local airline—Lineas Aereas Chaquenas Soc. de Econ. Mixta—to fly services in the Resistencia area of Argentina.

Address: Santa Maria de Oro 145, Resistencia, Chaco, Argentina.

AEROFLOT. Comparatively little is known about Aeroflot, which is in fact a Ministry with responsibility for all forms of air transport and agricultural and ambulance flying in Soviet Russia. Very extensive expansion and modernisation of Aeroflot has been in hand for the past several years, and with the Tu-104, the Russian airline was the second in the world to introduce jet service. Estimated fleet totals are 120 Tupolev Tu-104/A/B, 50 Ilyushin Il-18s, 50 Antonov An-10/A/16s, at least 12 Tu-114s and about 1,500 Ilyushin Il-12 and 14s and Li-2s. The Antonov An-24 and turbofan-powered Tu-124 are under development, and Aeroflot also uses the An-2 and Yak-12 for taxi services and miscellaneous duties, and Yak-24, Mi-4 and Ka-15 helicopters.

AEROLINEAS ARGENTINAS. State-owned as a department of the Ministry of Transport, this company was formed in 1949 as the flag carrier for international services. It operates within South America and to Cuba, the U.S.A. and Europe. The fleet comprises four de Havilland Comet 4s, five Douglas DC-6s, six DC-4s, 16 DC-3s, four Curtiss C-46s, four Convair

A part of Aeroflot's immense Tupolev Tu-104 fleet at Vnukovo. This Russian airline is believed to possess some 120 Tu-104s

240s and six Sandringham flying-boats. Nine Avro 748s are on order.
Address: Paseo Colon 185, Buenos Aires, Argentina.

AEROLINEAS CHILENAS. In association with TACA, this company flies between Chile and the Argentine, using a Consolidated PB4Y-2 Privateer. Local services are flown from Santiago, and a route from Santiago to Miami, by Curtiss C-46s, and Fairchild C-82s are used for all-freight services.
Address: Casilla 13, 724, Santiago, Chile.

AEROLINEAS INI Y CIA S.A. See Ini Airlines.

AEROLINEAS PERUANAS S.A. A comparatively new Peruvian operator, this company flies services between Lima, Santiago de Chile and Buenos Aires. The fleet comprises a Douglas DC-6, two DC-3s and a Curtiss C-46.
Address: Nicolas de Pierola 700, Lima, Peru.

AEROMARITIME. See Union Aeromaritime de Transport.

AERONAVES DE MEXICO S.A. One of the three Mexican airlines flying international services, Aeronaves was founded in 1934 and has grown by merging with other smaller companies. In addition to domestic services it flies to New York. The fleet includes two Bristol Britannia 302s, six Douglas DC-6s, three DC-4s, 26 DC-3s, two Lockheed L-749 Constellations and four Convair 340s with a Douglas DC-8 Srs. 50 on order.
Address: Ave. Mariano Escobedo No. 491, Mexico City.

AERO O/Y. See Finnair.

AEROTAXI OF COLOMBIA. In association with Avianca, operates a feeder network in Colombia with Cessna 170 and D.H. Beaver equipment.
Address: Carrera Ja., No. 16-51, Bogota, Colombia.

AEROTRANSPORTES LITORAL ARGENTINO S.A. This Argentinian carrier has been operating since 1958 on routes out of Rosario to Buenos Aires, Sante Fé, Cordoba and other points within Argentina. The fleet comprises four Douglas DC-3s.
Address: 859 Sarmiento, Rosario, Argentina.

AERO TRANSPORTES S.A. This small Mexican airline, known as ATSA, uses a Douglas DC-4 leased from Mexicana to fly between Monterray and Matamoros.
Address: Avenida Juaraz, Mexico City.

AEROVIAS ECUATORIANAS S.A. See Area.

AEROVIAS NACIONALES DE COLOMBIA S.A. See Avianca.

AEROVIAS NACIONALES DE HONDURAS S.A. This is a subsidiary of one of the other Honduran airlines, operating domestic services only with two Douglas DC-3s.
Address: Tegucigalpa, Honduras.

AEROVIAS PANAMA AIRWAYS. In collaboration with Ecuatoriana, this Panamanian airline flies on the route from Miami to Peru via Panama, Colombia and Ecuador. The fleet comprises a Douglas DC-6 and a DC-4, plus two Curtiss C-46s.
Address: Calle B. No. 1, El Cangrejo, Panama City.

AEROVIAS " Q " S.A. This Cuban operator flies services within Cuba and to a few points in the U.S.A., using three Douglas DC-4s and three Curtiss C-46s.
Address: Prado 252, Havana, Cuba.

AEROVIAS SUD AMERICANA INC. See ASA.

AEROVIAS VENEZOLANAS S.A. See Avensa.

AIR AFRIQUE. A company of this name was set up early in 1961 as a joint venture by eleven African states which were former French possessions, together with Air France and U.A.T. The eleven states, each with a 6% interest, are Cameroun, République Centrafricaine, Congo (the former French Congo), Côte d'Ivoire, Dahomey, Gabon, Haute-Volta, Mauritaine, Niger, Senegal and Tchad. Air France and U.A.T. each have a 17% interest, and are providing fifteen Douglas DC-4s previously used on African routes.

AIR ALGÉRIE. With headquarters in Algiers, this French company operates domestic and a few international services with a fleet of two L-749A Constellations, ten Douglas DC-4s, three DC-3s, three Nord Noratlas and six Caravelles (in course of delivery). The aircraft bear French registrations.
Address: 46 Boulevard Saint-Seans, Algiers.

AIR CANADA. Alternative name sometimes used by Trans-Canada Air Lines.

AIR CEYLON LTD. Ownership of this airline is shared by the Ceylon Government and K.L.M., the latter company providing technical assistance and a Lockheed Electra on charter for the international services to Singapore, Amsterdam and London. The fleet also includes three Douglas DC-3s for local services in Ceylon.
Address: Airlines Booking Centre, York Street, Colombo 1, Ceylon.

AIR CONGO. Under an agreement between Sabena and the Congo Republic early in 1961, a company of this name was set up to operate services in the Congo. Aircraft owned by Sabena and used in the Congo at the time of the Republic being formed were already flying in Air Congo markings in 1960, including Convair 440s, DC-3s and DC-4s.

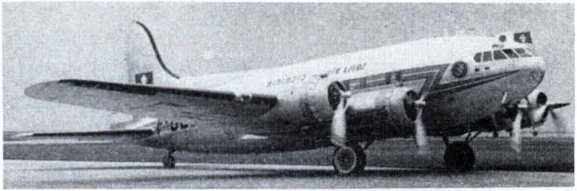
AIR FLORIDA HELICOPTER AIRWAYS. With Republic-assembled Sud-Aviation Alouette 2 turbine-powered helicopters, this company flies services in the area of Tampa and St. Petersburg, Florida.
Address: International Airport, Tampa, Florida, U.S.A.

AIR FRANCE. The national airline of France operates the longest route network of any carrier in the world, only just short of 200,000 miles, in providing a domestic service, an extensive European network, and services to all parts of Africa, to the Middle and Far East and North, Central and South America. It was formed in 1948 by the amalgamation of the existing Air France with Air Bleu (flying mail services) and Air France Transatlantique, and now has an interest in ten other airlines including those of Morocco, Tunis, Lebanon, Vietnam, Laos and Cambodia. Air France was the first airline to order the Sud-Aviation Caravelle and now has 35 delivered or on order; the remainder of the fleet comprises 20 Boeing 707-328s, ten Lockheed L-1649A Starliners and 20 L-1049 Super Constellations, 11 L-749A Constellations, eight Viscount 708s, 12 Breguet Deux Ponts, 27 Douglas DC-4s, and 29 DC-3s.
Address: 2 rue Marbeuf, Paris 8e, France.

Air France operates the " Deux Ponts " across the Mediterranean

AIR GABON. This company began flying local services in the " Forest Region " of Gabon around Port Gentil in 1961.
Address: B.P. 240, Port Gentil, Gabon, A.E.F.

AIR GUINÉE. Formed in 1961, this company is the national airline of the Republic of Guinea (formerly French Guinea) in West Africa. Its equipment comprises two Ilyushin Il-18s and three Avia 14s (including one freighter). These aircraft are flown by Russian and Czech crews on services within Guinea and to neighbouring African states.



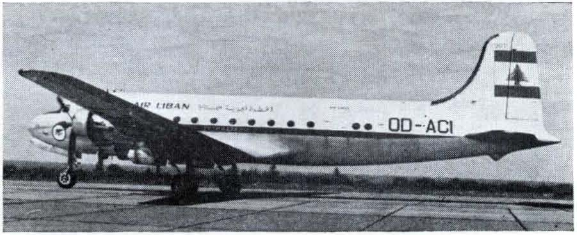
Air Laos operates three pre-war Boeing SA-307B Stratoliners

AIR INDIA INTERNATIONAL CORP. Since 1953, Air India has been wholly State-owned as the flag carrier on international services. A.I.I. flies in partnership with Qantas and B.O.A.C. on the Kangaroo route from Sydney through Singapore and Bombay to London and on to New York, and to points in Africa; a Bombay–Moscow service was opened in 1959. The fleet comprises six Boeing 707-437s, nine Lockheed L-1049Gs and a Douglas DC-3.
Address: New India Assurance Building, Mahatma Gandhi Road, Bombay 1, India.

AIR INTER. With aircraft chartered from Air France and Airnautic, including Vikings and DC-3s, this French company flies domestic services on a seasonal basis.
Address: 12 rue de Castiglione, Paris 1e, France.

AIR JORDAN. This company, formed by a merger of an earlier airline of the same name and Arab Airways (Jerusalem) Ltd., is assisted by the U.S. Transocean Air Lines, which has a financial interest. Services are flown in the Middle East and

The sole Douglas DC-4 currently operated by Air Liban



to Rome, using two Convair 240s, two Douglas DC-4s, two DC-3s, a Curtiss C-46 and a de Havilland Rapide.

Address: King Hussein Road (P.O.B. 274), Amman, Jordan.

AIR KATANGA. Formation of an airline of this name, to fly services in the " break-away " Congo republic of Katanga, was announced in Belgium early in 1961. Ex-Sabena DC-3s are operated.

AIR LAOS TRANSPORTS AERIENS. The French airlines Air France and Aigle Azur together own half the shares in Air Laos, which was formed jointly with local private interests in 1952 to fly domestic routes in Laos. Services are also flown to Saigon, Hong Kong, Bangkok and Phnom-Penh, the fleet comprising three Boeing Stratoliners, two Douglas DC-3s and seven de Havilland Beavers.

Address: 4 rue Manthathourath (P.O.B. 87), Vientiane, Laos.

AIR LIBAN. Assisted by Air France, Air Liban was originally known as Compagnie Générale de Transport. Services are flown from the Lebanon to Paris and Rome in Europe, to the West African coast via Tripoli and via Khartoum, and to a number of points in the Middle East. A Sud-Aviation Caravelle will be introduced in 1961, adding to the fleet of three Douglas DC-6s, a DC-4 and three DC-3s.

Address: Immeuble Esseily, Place Riad Solh (P.O.B. 1243), Beirut, Lebanon.

AIRLINES OF NEW SOUTH WALES PTY. LTD. This company was originally Butler Air Transport, its name being changed following its acquisition by Ansett Transport Industries in 1959. For services in New South Wales, South Queensland and Victoria, this airline has three Fokker F-27s, eight Douglas DC-3s and two Short S-25E Sandringhams.

Address: Kingsford Smith Airport, Mascot, N.S.W.

AIRLINES OF NEW ZEALAND. Ansett-A.N.A. of Australia holds a 49% interest in this private company, set up in 1961 to operate domestic services in New Zealand with two ex-Ansett DC-3 Viewmasters.

AIRLINES OF SOUTH AUSTRALIA PTY. LTD. The name of this company was changed from Guinea Airways following its acquisition by Ansett Transport Industries in 1959. With two Convair 440s and four Douglas DC-3s it flies services in South Australia and New South Wales.

Address: Adelaide Airport, West Beach, South Australia.

AIRLINES OF VICTORIA. This wholly-owned subsidiary of Ansett-A.N.A. proposed to operate Piaggio P.166s on local services in the area of Victoria, N.S.W., later in 1961.

AIR MADAGASCAR. With six de Havilland Rapides and four Douglas DC-3s this company operates a network of services in the island of Madagascar. It will be superseded in October 1961 by Madair.

Address: 8 rue General Roques, P.O.B. 437, Tananarive, Madagascar.

AIR MALI. This is the operating name of a new airline set up by the Mali Republic, comprising the former French West African territory of Soudan. Three ex-B.E.A. DC-3s were presented to Air Mali by the British government in 1961.

AIR SAFARIS LTD. Primarily a charter operator, this British independent absorbed the transport division of Don Everall late in 1960, and assumed responsibility for the scheduled services of this company to the Channel Islands, Isle of Wight and Exeter from Birmingham. The fleet includes four Hermes and eight Vikings.

Address: Old Terminal Building, Gatwick Airport, Horley, Surrey.

AIR ST. PIERRE. A small Canadian operator, Air St. Pierre uses a Douglas DC-3 for a scheduled service between Saint Pierre on Miquelon Island, and Sydney, Nova Scotia.

Address: St. Pierre, Miquelon Island, Canada.

AIR VIETNAM. The airline of Vietnam, this company flies local services and to Laos, Cambodia and Thailand, and in pool with Air France to Paris. The fleet comprises one Douglas DC-4 and seven DC-3s with two Viscounts leased from Air France early in 1961.

Address: 116 Boulevard Nguyen-Hue (P.O.B. 217), Saigon, Vietnam.

ALASKA AIRLINES INC. From its base in Fairbanks, Alaska, this company operates one long-haul service to Seattle, and local routes within Alaska. A Convair 880-M has been ordered, other equipment comprising three Douglas DC-6Cs, two DC-4s, three Curtiss C-46s and a dozen single-engined types.

Address: 2320 Sixth Avenue, Seattle 1, Washington, U.S.A.

ALASKA COAST AIRLINES. A local operator in Alaska, serving the south-eastern part of the 49th State, with two PBY-5A Catalina and eight Grumman Goose amphibians and six single-engined land and floatplanes.

Address: 2 Marine Way, Juneau, Alaska.

ALISUD. Formed in mid-1960 as Cia Aerea Meridionale to operate helicopter services, in conjunction with Elivie, between Salerno and Ischia in Italy. An Agusta-Bell 47 is used.

Address: Via Medina 40, Naples, Italy.

ALITALIA–L.A.I. Since its merger with Linee Aeree Italiane in 1957, Alitalia has become the sole Italian passenger airline, responsible for domestic and international services. It flies

A Boeing 707-437 of Air India International

to all parts of Africa, to North and South America, the Middle East, Pakistan and India and to most West European countries. The fleet comprises ten Douglas DC-8 Srs. 40s, 14 Caravelle IIIs, five Douglas DC-7Cs, eight DC-6Bs, three DC-6s, nine Vickers Viscount 785s and five 745s, six Convair 440s and four Douglas DC-3s.

Address: Viale Maresciallo Pilsudski 92, Rome, Italy.

ALLEGHENY AIRLINES, INC. One of the U.S. local service carriers, Allegheny operates in the Middle Atlantic–Ohio Valley–New England areas taking in Boston, New York, Philadelphia, Baltimore, Washington, Pittsburgh, Buffalo, Cleveland and Detroit. It was the first airline to operate Eland-powered Convairs (on lease) and has ordered five of these conversions for service in 1961; the remainder of the fleet comprises ten Convair 440s, 12 Martin 202s and ten Douglas DC-3s.

Address: Washington National Airport, Washington, 1, D.C., U.S.A.

ALL NIPPON AIRWAYS CO. LTD. Privately-owned, All Nippon flies domestic services only in Japan, having merged with two other Japanese local airlines since its formation in 1952. The fleet comprises six Vickers Viscount 839s (1961–2 delivery), three Convair 440s, nine Douglas DC-3s, four de Havilland Doves and three de Havilland Herons. Six F-27 Friendships are on order.

Address: Hiko-kan Building, 3–1 Shiba Tamuracho, Minato-ku, Tokyo, Japan.

ALOHA AIRLINES INC. One of the two scheduled airlines in America's 50th State (Hawaii), Aloha operates a fleet of six Fairchild F-27s and seven Douglas DC-3s on routes between the major islands.

Address: Honolulu International Airport, Honolulu, Hawaii.

AMERICAN AIRLINES INC. One of the world's largest airlines, American carries over eight million passengers a year—almost totally on domestic U.S. services although routes are also flown to Canada and Mexico. The company has been one of the pace-setters in re-equipment with turbine equipment, being the first to order the Lockheed Electra (34 in service) and the Convair 990 (25 on order). It has 24 Boeing 707-120s in process of conversion to -120B with turbofans, and a fleet of 25 turbofan-powered 720Bs in production. Services with both these turbofan types were inaugurated in March 1961. Also used are 25 Douglas DC-7Cs, ten DC-7F freighters, 20 DC-6Bs, 45 DC-6s, five DC-6A freighters and 33 Convair 240s.

Address: 100 Park Avenue, New York 17, N.Y., U.S.A.

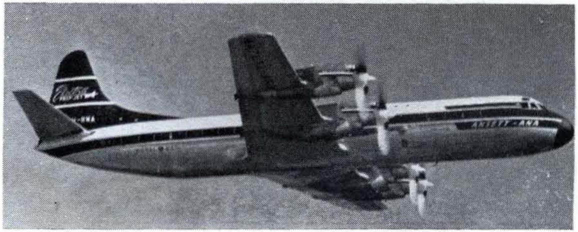
AMPHIBIAN AIRWAYS. This new airline flies Grumman Widgeons on the 36-mile route between Invercargill in southern New Zealand and Stewart Island off the coast.

Address: The Airport (P.O.B. 860), Invercargill, New Zealand.

ANSETT-A.N.A. Ansett Airways began operations in 1936 and purchased Australian National Airways in 1957, when the name was changed to its present form. In addition to an extensive route network throughout Australia, Ansett-A.N.A. now flies to Port Moresby and Lae in New Guinea. The fleet comprises three Lockheed Electras, ten Viscount 832/812/747/720, nine Fokker F-27s, two Douglas DC-6Bs, two DC-4s (freight), 12 DC-3s, one Convair 440 and four Bell 47 helicopters for scheduled and charter operations. The company also holds options on Max Holste Super Broussards and Sikorsky S.61 helicopters.

Address: 489 Swanston Street, Melbourne C.1, Victoria.

Ansett-A.N.A. operates three Lockheed L-188 Electras



All American Airlines' 707-123s are being converted to 707-123Bs

APACHE AIRLINES. Using Beechcraft Bonanzas, this small airline flies scheduled services between Phoenix, Tucson and Fort Huachuca in Arizona.
Address: P.O.B. 11035, Municipal Airport, Tucson, Arizona, U.S.A.

ARABAIR. Alternative name sometimes used by United Arab Airlines.

AREA, AEROVIAS ECUATORIANAS C.A. This company was an international operator between 1948 and 1954, but now flies only domestically in Ecuador, using two Douglas DC-3s.
Address: P.O.B. 2226, Bolivar 318, Quito, Ecuador.

ARIANA AFGHAN AIRLINES CO. LTD. Pan American has a large minority interest in this company, which operates a domestic network, and internationally to points in the Middle East, India and Europe. The fleet comprises two Douglas DC-4s and four Douglas DC-3s.
Address: 283 Chourai Sherpur, Share-Nav (P.O.B. 76), Kabul, Afghanistan.

Allegheny Airlines are receiving five Eland-Convair CV-440s

ARKIA, ISRAEL INLAND AIRLINES, LTD. A subsidiary of El Al, Arkia was formed in 1950 to operate domestic services in Israel, which it now does with a fleet of four Douglas DC-3s and a de Havilland Dove.
Address: 42 Maze Street (P.O.B. 834), Tel Aviv, Israel.

ASA INTERNATIONAL AIRLINES. This company was formed as Aerovias Sud Americana in 1947 and obtained the first U.S. international all-cargo certificate in 1952. It operates cargo service to Central and South America from Florida with two Douglas DC-4s and three Curtiss C-46s.
Address: International Airport, St. Petersburg 33, Florida.

ASPEN AIRWAYS INC. This airline was formed in 1960 to operate scheduled service between Aspen and Denver in Colorado, for which it uses Beech D-18 and Cessna 310 twins.
Address: 310 East Main Street, Aspen, Colorado, U.S.A.

ATLANTIC SEABOARD AIRLINES INC. Founded in 1960, this airline flies de Havilland Doves between Atlantic City and Philadelphia.
Address: Bader Field, Atlantic City, New Jersey, U.S.A.

ATSA. See Aero Transportes S.A.

AUSTRAL. This company—Cia Argentina de Transportes Aereos S.A.—operates with four Curtiss C-46s on routes from Buenos Aires to Mar del Plata and other points as far as Rio Grande. Three Fokker F-27s are on order.
Address: Leandro N. Alem 498, Buenos Aires, Argentina.

AUSTRIAN AIRLINES. Formed in 1957 with the help of S.A.S., the Norwegian company Fred Olsens Flyselskap and Austrian banks, Austrian Airlines (Osterreichische Luftverkehrs Aktiengesellschaft) began operations in 1958 with four Viscount 779s chartered from Fred Olsens, and now flies five Viscount 837s purchased in 1959 and two Viscount 745s purchased in 1960. From Vienna it flies to a number of cities in Europe, and locally in Austria.
Address: Opernring 13, Vienna 1, Austria.

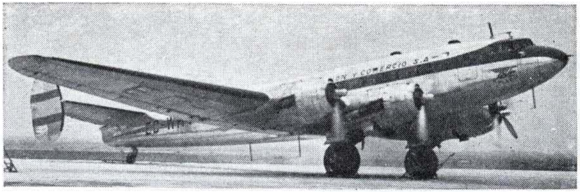
AVALON AIR TRANSPORT. This company operates regular services from Los Angeles airports to Catalina Island, off the California coast. Included in the fleet is the sole surviving Sikorsky VS-44A flying boat, together with six Grumman Goose amphibians and two Douglas DC-3s.
Address: Municipal Airport, Long Beach, California, U.S.A.

AVENSA. One of three Venezuelan airlines, Aerovias Venezolanas S.A. is partly owned by Pan American. In addition to local services it flies to Jamaica, Miami, and New Orleans. The fleet comprises five Fairchild F-27s, ten Douglas DC-3s, five Convair 240s and two 440s, and three Curtiss C-46s.

Address: Apartado de Correos No. 943, Caracas, Venezuela.

AVIACO. The smaller of two Spanish airlines, Aviacion y Comercio S.A. flies domestic services and to North Africa, France and Portugal with three Convair 440s, Douglas DC-3s, three Bristol 170s and five de Havilland Herons. The five Aviaco Languedocs are not used for scheduled services.

Address: Aduana 33, Madrid, Spain.



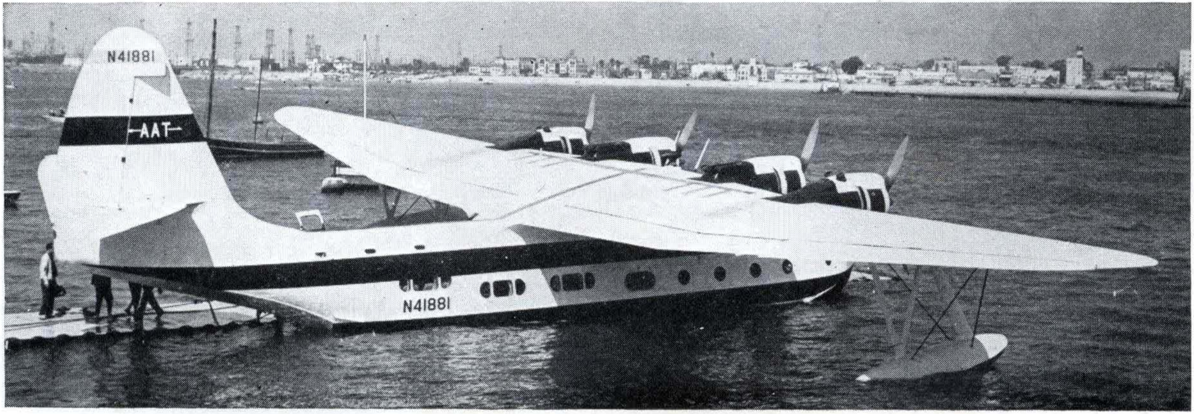
Aviaco is the last commercial operator of the Languedoc

AVIANCA. One of the three Colombian airlines, Avianca or Aerovias Nacionales de Colombia S.A. has its roots in the oldest airline in the Americas, S.C.A.D.T.A. It operates internationally to Miami and New York in the U.S.A., to Jamaica, Puerto Rico, Panama, Venezuela and Peru; and to Lisbon, Madrid, Paris and Frankfurt in Europe, using two Boeing 707s leased from Pan American, four Lockheed L-1049G Super Constellations and three L-749 Constellations, 12 Douglas DC-4s and 31 DC-3s. Two Boeing 720-059Bs are on order.

Address: Carrera 7a, Nos. 16–14, Bogata, Colombia.

AVIATECA. Empresa Guatemalteca de Aviacion is a Government-owned airline in Guatemala, flying scheduled passenger and freight services locally in this Central American country. The fleet comprises five Douglas DC-3s, two DC-4s, two Curtiss C-46s and a Norseman.

The last surviving Vought-Sikorsky VS-44A is the flagship of Avalon Air Transport and is used on the 45-mile route between Long Island and Catalina Island. Three VS-44s were built for trans atlantic services with American Export Lines



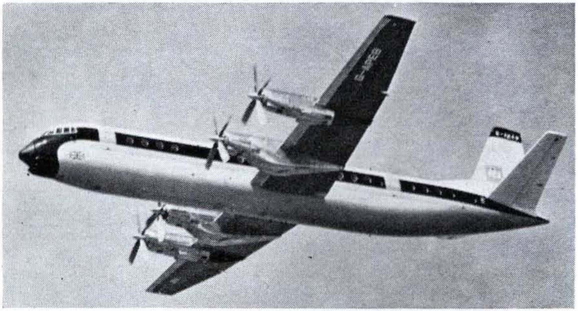
Address: Avenida Hincapie, Aurora Airport, Guatemala City.

BAHAMAS AIRWAYS LTD. A wholly-owned subsidiary of B.O.A.C. Associated Companies, this operator flies with Douglas DC-3s and Grumman Goose amphibians in the Bahamas Islands group and from Nassau to Miami, Fort Lauderdale and West Palm Beach.

Address: Shirley Street (P.O.B. 65), Nassau, N.P.I., Bahamas.

BAY OF PLENTY AIRWAYS LTD. This small airline has operated since 1958 on the route Auckland–Tauranga–Rotorua–Wellington, using an Aero Commander 680 and a Cessna 182.

Address: Electric Power Board Building (P.O.B. 448), Spring Street, Tauranga, New Zealand.



B.E.A. placed the Vanguard 951 in service early in 1961

B.C. AIR LINES LTD. This small Canadian carrier operates scheduled services in the west coast area of Vancouver Island, for which its fleet includes three Grumman Mallards, three Norsemen and nine de Havilland Beavers.

Address: Vancouver International Airport, Richmond, B.C., Canada.

B.E.A. British European Airways was one of the two nationalised airlines established in Britain after the Civil Aviation Act, 1946, and is now responsible for the majority of British passenger, freight and mail services within the U.K. and to the Continent of Europe and Mediterranean border countries. A total of 84 points in Europe are served by the fleet of 14 de Havilland Comet 4Bs, 6 Vickers Vanguard 951s, 23 Viscount 701s, 20 Viscount 802s, 19 Viscount 806s (B.E.A. was the first airline to purchase each of these types), 21 Douglas DC-3 Pionairs (including seven freighters), two D.H. Herons (Scottish ambulance services) and three D.H. Rapides. B.E.A. has an experimental helicopter unit with two Sikorsky S-55s, two Bell 47s and a Sycamore, and expects to begin operations with Westland 192Cs in 1962/3. Twenty-four D.H. 121 Tridents, 14 Vanguard 953s, three Heralds and three Argosies are on order.

Address: Bealine House, South Ruislip, Middlesex.

B.K.S. AIR TRANSPORT LTD. This British independent operator flies scheduled services within the U.K. and to points in Europe, a vehicle ferry from Liverpool to Dublin and inclusive tour and charter operations. It has ordered five Avro 748s and has four ex-B.E.A. Airspeed Ambassadors (Elizabethans), four Douglas DC-3s and three Bristol 170s.

Address: Berk House, Baker Street, London, W.1.

B.O.A.C. Britain's long-haul flag carrier, British Overseas Airways Corporation, is responsible for the majority of the international services from the U.K. to destinations outside Europe, and for a few within Europe. The Corporation succeeded Imperial Airways and British Airways in 1940 and through those airlines can trace its history back to 1919 and the beginnings of air transport in Britain. To-day it flies round the world via India, Pakistan, Singapore, Hong Kong, Tokyo, and the U.S.A., and flies services to many points in North America, the Caribbean, South Africa, Australasia, South America, and the Near, Middle and Far East. The fleet includes 15 Boeing 707-436s, 19 de Havilland Comet 4s (with the progenitor of which B.O.A.C. was the first in the world to introduce jet services), 17 Bristol Britannia 312s, 15 Britannia 102s, and ten Douglas DC-7Cs (two converted to DC-7F freighters). On order are 45 Vickers V.C.10s and Super V.C.10s.

Address: B.O.A.C. Headquarters, London Airport, Hounslow, Middlesex.

BONANZA AIR LINES INC. Originally a charter company, Bonanza became a local service operator in 1949, since when it has grown steadily. With eight Fairchild F-27As and six Douglas DC-3s the company flies in the Nevada and Arizona area, serving Las Vegas and Reno among other cities.

Address: McCarran Field, P.O.B. 391, Las Vegas, Nevada, U.S.A.

BORNEO AIRWAYS LTD. Formed in 1957, this airline is partly owned by B.O.A.C. and is developing air services in British Borneo as a social service and to help expand trade, as well as to feed the trunk routes of Cathay Pacific. The fleet comprises two de Havilland Rapides and three Scottish Aviation Twin Pioneers.

Address: Labuan, North Borneo.

BRAATHENS S.A.F.E. This Norwegian independent airline flies scheduled services within Norway and international charter flights. The fleet comprises two Douglas DC-4s, two DC-3s and two Fokker F-27s. Two additional F-27s are on order. The initials S.A.F.E. are for South-American and Far East Airtransport, A/S.

Address: Fr. Nansensplass 7, Oslo, Norway.

BRANIFF INTERNATIONAL AIRWAYS INC. One of the smaller U.S. trunk carriers, Braniff flies services primarily in the central and southern U.S. states, and southward as far as Buenos Aires. The fleet comprises four Boeing 707-227s, eight Lockheed Electras, six Douglas DC-7Cs, ten DC-6s, three DC-3s, two Lockheed L-049 Constellations, 25 Convair 340s and six 440s, and two Curtiss C-46s for freighting. Four Boeing 720-027s will be delivered in 1961.

Address: Exchange Park, Dallas 35, Texas, U.S.A.

BRITISH AVIATION SERVICES LTD. This is the parent company of Silver City Airways, Britavia, and a number of other former independent companies which no longer operate in their own name. The activities of Silver City are described separately.

Address: Silver City House, 62 Brompton Road, London, S.W.3.

BRITISH GUIANA AIRWAYS (GOVERNMENT). Originally privately owned, this local operator in British Guiana was taken over by the Government in 1955 and is now managed by B.W.I.A. It flies locally and to the West Indian islands, using three Douglas DC-3s and three Grumman G-21A Goose amphibians.

Address: 32 Main Street, Georgetown, British Guiana.

BRITISH HONDURAS AIRWAYS. A wholly-owned subsidiary of B.W.I.A., this airline was originally known as British Colonial Airlines. With four Cessna 170/180 monoplanes it flies local services in British Honduras.

Address: 7 Cork Street (P.O.B. 186), Fort George, Belize, British Honduras.

BRITISH UNITED AIRWAYS. This British independent airline was created in July 1960 by a merger between Airwork and Hunting-Clan. The Airwork group already included Air Charter, Morton, Olley, Transair and two helicopter operators, Fison-Airwork and Bristow, all of which now operate as B.U.A. in the Air Transport or Helicopter divisions. Channel Air Bridge, a former subsidiary of Air Charter, continues to operate in its own name. B.U.A. flies scheduled Skycoach services and economy-class services to East and Central Africa in parallel with B.O.A.C. and other local services in the U.K. and Europe, in addition to charter and trooping operations. The fleet comprises four Bristol Britannias, two Douglas DC-6Cs, 11 Vickers Viscounts, five DC-4s, six DC-3s, two D.H. Herons, seven Doves, three Rapides, two Scottish Aviation Pioneers, two Beech Twin Bonanzas and a D.H. Beaver; the helicopter fleet includes 14 Westland Whirlwinds, four Widgeons, 23 Hiller UH-12s and seven Bell 47s. Ten BAC-111s are on order.

Address: 35 Piccadilly, London, W.1.

BRITISH WEST INDIAN AIRWAYS LTD. See B.W.I.A.

B.W.I.A. Usually known by its initials, British West Indian Airways Ltd. is a wholly-owned subsidiary of B.O.A.C., operating over a wide area in the West Indies, to Puerto Rico, Bermuda, Barbados, British Guiana, British Honduras, the Leeward and Windward Islands, Miami, New York and London. Bristol Britannias and crews are leased from B.O.A.C. for the long-haul services and the local fleet comprises eight Viscount 702/772s and three Douglas DC-3s.

Address: Kent House, Long Circular Road, Maraval, Port of Spain, Trinidad.

C.A.A. See Central African Airways Corporation.

CAMBRIAN AIRWAYS LTD. In association with B.E.A., Cambrian flies local services in South Wales and the West of England, with connections to Manchester, the Channel Islands, France and Northern Ireland. Five Douglas DC-3s are chartered from B.E.A.

Address: Cardiff (Rhoose) Airport, nr. Barry, Glamorganshire.

CANADIAN PACIFIC AIRLINES LTD. This privately-owned subsidiary of Canadian Pacific Railways shares with the state-owned T.C.A. the most important domestic and international routes from Canada, serving points in the Far East, Australia, South America and Europe. Services in Canada are flown by three Douglas DC-3s, two Curtiss C-46s and five Convair 240s; the main-line domestic and international routes are flown by eight Douglas DC-6Bs and six Britannia 314/324s, with four Douglas DC-8 Srs. 50s on order.

Address: Vancouver International Airport, Richmond, B.C., Canada.

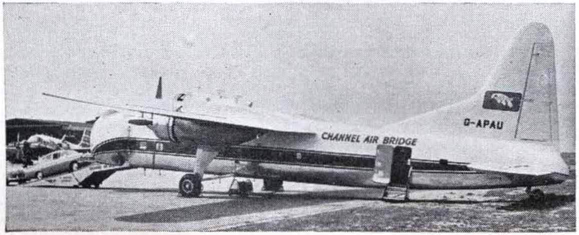
The Ceskoslovenske Aerolinie fleet now includes six Il-18s

CAPITAL AIRLINES INC. Founded in 1927, this company changed its name from Pennsylvania-Central Airlines in 1948, and gained fame in 1955 as the first U.S. operator of the Vickers Viscount, eventually ordering 60 of this type. In 1960, Capital opened negotiations to merge with United Air Lines after suffering serious financial losses through lack of jet equipment. At the end of the year its fleet comprised 56 Viscount 745s, three DC-3s, seven DC-6s (on lease) and nine Lockheed L-049 Constellations; 15 of these Viscounts were sold and the remainder of the fleet absorbed by United on July 1, 1961.
Address: National Airport, Washington 1, D.C., U.S.A.

CARIBAIR. See Caribbean Atlantic Airlines Inc.

CARIBBEAN ATLANTIC AIRLINES INC. As Caribair, this airline operates services from San Juan (Puerto Rico) to the Virgin Islands, St. Martin, the British West Indies, Dominica and elsewhere. The fleet comprises seven Douglas DC-3s.
Address: P.O.B. 6035, Loiza Station, Santurce, Puerto Rico.

The Bristol 170 Mk. 32 serves with Channel Air Bridge



CASPAIR LTD. In association with East African Airways, Caspair flies scheduled services round Lake Victoria, using three de Havilland Rapides. The company is privately owned and has a fleet of single-engined aircraft for charter operations.
Address: P.O.B. Nairobi West Airport, Nairobi, Kenya.

C.A.T. See Civil Air Transport.

CATHAY PACIFIC AIRWAYS LTD. B.O.A.C. has had an interest in C.P.A. since 1959, when the latter absorbed Hong Kong Airways; the Australian airline Ansett-ANA also holds some shares. With two Lockheed Electras, one Douglas DC-6B, one DC-6, one DC-4 and one DC-3, Cathay Pacific flies services from Hong Kong as far afield as Sydney, Tokyo, Manila, Singapore, Rangoon and Calcutta.
Address: 9 Chater Road (P.O.B. 4), Hong Kong.

CAUSA. Cia Aeronautica Uruguaya S.A. originally flew Junkers Ju-52 floatplanes in Uruguay, and now has a fleet of three Short Sandringham flying boats for services between Colonia, Montevideo and Buenos Aires.
Address: San Jose 1156, Montevideo, Uruguay.

CENTRAL AFRICAN AIRWAYS. C.A.A. was formed in 1946 as the national airline of what is now the Central African Federation. In 1957 it relinquished to B.O.A.C. its traffic rights to the U.K. and now operates, with five Viscount 748s, six Douglas DC-3s and five DHC-2 Beavers, locally within the Federation and to other African territories.
Address: Salisbury Airport, Salisbury, S. Rhodesia.

CENTRAL AIRLINES INC. This American local service operator flies a network of routes based on Oklahoma City and extending into Texas, Colorado, Arkansas and Missouri. The fleet comprises fifteen Douglas DC-3s.
Address: Amon Carter Field, Fort Worth, Texas.

CESKOSLOVENSKE AEROLINIE. The Czechoslovakian airline resumed operations in 1945 with Douglas DC-3s, and was nationalised in 1949, since when it has been almost entirely re-equipped with Russian equipment. The fleet now comprises four Tupolev Tu-104As, six Ilyushin Il-18s, 25 Il-14s (built by Avia) and five DC-3s. An extensive European network is flown, as well as services to India, Egypt, North Africa and the Middle East.
Address: Mamesti Republiky 655/8, Prague 1, Czechoslovakia.

C.H.A. See Chicago Helicopter Airlines.

CHANNEL AIR BRIDGE. Although part of British United Airways, Channel Air Bridge continues to operate in its own name the vehicle ferry services from Southend to France, Belgium, Holland and Germany. The fleet comprises 13 Bristol 170s and ten Douglas DC-4 Carvair conversions are to be obtained in due course.

Address: Southend Airport, Rochford, Essex.

CHANNEL AIRWAYS. This is the operating name of East Anglian Flying Services, Ltd., a U.K. local operator flying services from the eastern part of England to the Channel Islands, Paris, Ostend, Rotterdam and Le Touquet. The fleet comprises four Vickers Vikings, two Douglas DC-3s, two Bristol 170s, four D.H. Doves and two Rapides.

Address: Southend Airport, Essex.

CHICAGO HELICOPTER AIRWAYS INC. The biggest scheduled helicopter operator in the world, C.H.A. is an associate of Helicopter Air Services which has been flying mail and freight services in the Chicago area since 1949. With six Sikorsky S-58s, C.H.A. flies between the three Chicago airports and to Gary (Indiana) and Winnetka. Six Sikorsky S-61s are on order for delivery later in 1961.

Address: 5240 West 63rd Street, Chicago 38, Illinois, U.S.A.

CIVIL AIR TRANSPORT. This airline was formed in 1946 by the late General C. L. Chennault (of Flying Tigers fame) and moved to Formosa with the Chinese Nationalist forces in 1949. In addition to domestic services in Formosa, C.A.T. flies regularly to Japan, South Korea, Okinawa, Hong Kong, the Philippines and Siam, using a Douglas DC-6B, two DC-4s, five DC-3s, 18 Curtiss C-46s and two Catalinas. A Convair 880-M for delivery in 1961 will be operated as the " Mandarin Jet ".

Address: 46 Chung Shan Road North, 2nd Section, Formosa.

CIVIL AVIATION ADMINISTRATION OF CHINA. Now wholly Chinese controlled, C.A.A.C. still relies entirely upon Russian equipment and technical assistance from Aeroflot; until 1954, Russian personnel also aided the management of the Chinese Peoples Republic airline. Ilyushin Il-18s have recently been introduced on some of the international routes including that to Irkutsk in Russia; other routes are flown by Ilyushin Il-14s and Il-14Ms and Li-2s. Antonov An-2s are also used.

Address: 15 Chang-an Street (East), Peking, People's Republic of China.

COHATA D'HAITI. This is a military-controlled air transport service, operating under the name Cie Haitienne de Transports Aeriens to provide local service in Haiti with two Douglas DC-3s and a Beech 18.

Address: Bowen Field, Port-au-Prince, Haiti.

COMMERCIAL AIR SERVICES (PTY.) LTD. In association with British United Airways, C.A.S. flies scheduled and charter services from Rand Airport, Germiston. The equipment comprises two Lockheed Lodestars in addition to some single-engined Cessnas.

Address: Balgownie House, Commissioner Street (P.O.B. 2245), Johannesburg, Transvaal, Union of South Africa.

COMPAGNIA AEREA MERIDIONALE. See Alisud.

COMPAGNIA ITALIANA ELICOTTERI, S.R.L. Principally concerned with helicopter charter and agricultural flying, this company flies a scheduled helicopter service between Rimini and San Marino with Agusta-Bell 47Js.

Address: Via Lima 42, Rome, Italy.

COMPAGNIE AIR TRANSPORT. In conjunction with Silver City, this company flies three Bristol 170s on coach–air–rail services between London and Paris.

Address: 9 Boulevard Malesherbes, Paris 8e, France.

COMPAGNIE DE TRANSPORTS AERIENS INTERCONTINENTAUX. See T.A.I.

COMPAGNIE HAITIENNE DE TRANSPORTS AERIENS. See Cohata d'Haiti.

COMPANIA AERONAUTICA URUGUAYA S.A. See CAUSA.

COMPANIA ARGENTINA DE AERONAVEGACION C.I.F.S.A. See Norsur.

COMPANIA ARGENTINA DE TRANSPORTES AEREOS S.A. See Austral.

COMPANIA DE AVIACION " FAUCETT " S.A. Taking its name from its founder, Elmer J. Faucett, this is one of the oldest airlines in South America, operating domestically in Peru. The fleet still includes four old Stinson-Faucetts, in addition to a Douglas DC-6B, four DC-4s, and ten DC-3s.

Address: Jiron Union 926 (Hotel Bolivar Building), Lima, Peru.

COMPANIA DOMINICANA DE AVIACION, C. por A. The only Dominican airline, this company is an associate of Pan American, flying local services and to Haiti and Miami with

A major regional trunk carrier, Continental operates five DC-7Bs

two Douglas DC-4s, a DC-3, four Curtiss C-46s and a de Havilland Beaver.

Address: General Andrews Airport, Ciudad Trujillo, Dominica.

COMPANIA ECUATORIANA DE AVIACION S.A. This airline flies with two Curtiss C-46s over a route between Miami and Santiago, with calls at Panama, Cali Quito, Guayaquil and Lima.

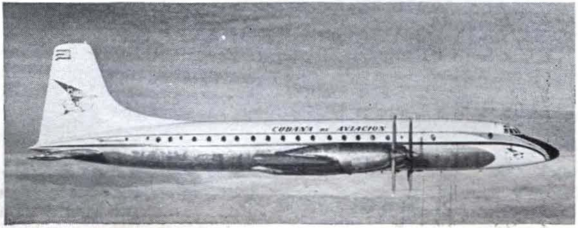
Address: Oficina 32, Pasaje Amador, B-7, Quito, Ecuador.

COMPANIA PANAMENA DE AVIACION S.A. See COPA.

CONNELLAN AIRWAYS LTD. This privately-owned Australian operator serves 110 points in the Northern Territory and towns in Western Australia, Queensland and South Australia, with a mixed fleet including three Beech 18s, two Beech Travelairs, three Cessna 180s and two Cessna 182s.

Address: Townsite Aerodrome, Alice Springs (P.O.B. 1), Northern Territory, Australia.

The principal Cuban airline, Cubana has three Britannia 318s



CONTINENTAL AIRLINES INC. Originating in Texas in 1934, Continental is now a major regional trunk carrier, operating through eight states from the U.S. west coast as far east as Chicago. Its fleet comprises five Boeing 707-124s, 13 Viscount 812s, five Douglas DC-7Bs, a DC-6B and ten leased DC-3s.

Address: Stapleton Airfield, Denver 16, Colorado.

COPA. Founded in 1946, Cia Panamena de Aviacion S.A. flies a domestic service in Panama and to San Jose in Costa Rica with two Douglas DC-3s and two Curtiss C-46s.

Address: 25 Avenida Peru, Panama City.

CORDOVA AIRLINES INC. This Alaskan operator flies scheduled services between Anchorage, Cordova and Seward with two Douglas DC-3s and a Curtiss C-46.

Address: P.O.B. 6203, Anchorage, Alaska.

C.P.A. See Cathay Pacific Airways Ltd.

C.P.A.L. See Canadian Pacific Airlines.

CRUZEIRO do SUL. This company—Servicos Aereos Cruzeiro do Sul, Ltda.—succeeded the German Condor Syndikat and is now owned by the Brazilian Government. It flies domestic services in Brazil and to British and French Guiana and Argentina. The fleet comprises 27 DC-3s, four Convair 440s and 14 240/340s. Seven Fairchild C-82s were retired in 1961.

Address: Avenida Rio Branco 128 (P.O.B. 190), Rio de Janeiro, Brazil.

C.S.A. See Ceskoslovenske Aerolinie.

CUBANA. The principal Cuban airline, Cia Cubana de Aviacion, S.A. has operated domestic services since 1930 (originally with Ford Trimotors) and internationally since 1946. Overseas points served include Miami, New York and Madrid. The fleet comprises three Bristol Britannia 318s (with one other leased to Cunard Eagle), three Lockheed L-1049G Super Constellations and one L-049, three Vickers Viscount 818s, and five Douglas DC-3s.

Address: Aeropuerto Internacional, Rancho Boyeros, Havana, Cuba.

CUNARD EAGLE AIRWAYS LTD. Formed as Eagle Aviation in 1948, this company is now associated with the Cunard Steamship Co., which has a majority holding. It operates first, economy and Skycoach services in its own right to Bermuda, and a number of other scheduled services in the U.K. and Europe. The fleet comprises three Douglas DC-6Cs, a

Bristol Britannia 318 and two 324s, two Viscount 755s and ten Vikings. Two Boeing 707-465s have been ordered for 1962 delivery.

Address: Marble Arch House, 40 Edgware Road, London, W.2.

CUNARD EAGLE AIRWAYS (BAHAMAS) LTD. Associated with Cunard Eagle Airways, Eagle Bahamas uses two Viscount 707s (jointly with Cunard Eagle Bermuda) to fly services between Nassau and Miami.

Address: Windsor Field, Nassau, N.P.I., Bahamas.

CUNARD EAGLE AIRWAYS (BERMUDA) LTD. Associated with Cunard Eagle Airways, this Bermuda company operates with two Viscount 707s (shared with Cunard Eagle Bahamas) from Nassau up to New York, Montreal and Baltimore.

Address: Radio Centre, Bermudiana Road, Hamilton, Bermuda.

CYPRUS AIRWAYS LTD. This company, jointly owned by the Government of Cyprus and B.E.A. (with a 22% holding), originally operated Douglas DC-3s, but in 1958 arrangements were made for all Cyprus Airways services, principally in the Mediterranean area, to be flown by B.E.A. aircraft. Viscount 806s and Comet 4Bs are now used.

Address: 16 Byron Avenue, Nicosia, Cyprus.

DAN-AIR SERVICES LTD. A small British independent formed in 1953, Dan-Air flies local services in the U.K. and to the Isle of Man, Channel Isles, Basle, Deauville and Bordeaux, using three Airspeed Elizabethans, three Bristol 170s, two DC-3s and two D.H. Doves. Four Avro Yorks are used for scheduled freighting under charter to B.E.A.

Address: Bilbao House, 36–38 New Bond Street, London, E.C.2.

DE KRONDUIF LTD. Managed by K.L.M., de Kronduif flies local services in New Guinea. The fleet comprises three Douglas DC-3s, three de Havilland Beavers and three Scottish Aviation Twin Pioneers.

Address: 1, Plesmanweg, The Hague, Holland.

DELTA AIR LINES INC. Founded in 1925 to undertake agricultural flying, Delta progressed to scheduled operations in 1929 and is now a major U.S. regional trunk carrier, flying services throughout the eastern half of the country and internationally to Cuba, Haiti, Dominica, Puerto Rico, Jamaica and Venezuela. The company was the first to operate Convair 880s and, jointly with United, first to operate the Douglas DC-8 Srs. 10; its fleet includes 12 and six of these types respectively in addition to 20 Douglas DC-7s, 11 DC-6s, 28 Convair 340s and 440s and five Curtiss C-46 freighters.

Address: Atlanta Airport, Atlanta, Georgia, U.S.A.

DERBY AIRWAYS. Operated by Derby Aviation, this company flies scheduled services within the U.K. and to the Continent, in addition to inclusive tours and charters. Its fleet comprises six Douglas DC-3s.

Address: 78 Buckingham Gate, London, S.W.1.

DETA. These are the initials of Direcçao de Exploraçao dos Transportes Aéreos, a Government-owned airline operating services within Mozambique and to Johannesburg, Durban and Salisbury. Among the company's fleet in 1960 were two ancient Junkers Ju-52/3m tri-motors, together with four D.H. Rapides, four D.H. Doves, three Douglas DC-3s and three Lockheed Lodestars.

Address: Avenida do General Machado 2–2 (P.O.B. 2060), Lourenço Marques, Mozambique.

DEUTSCHE LUFTHANSA. Using the same name and the same symbol as the West German company, this airline was set up in East Berlin in 1954. It flies an extensive domestic network and to cities in the Eastern European Bloc and Russia, using Ilyushin Il-18s and Il-14s.

Address: Franzosische Str. 53–56, Berlin W. 8, German Democratic Republic.

DEUTSCHE LUFTHANSA AKTIENGESELLSCHAFT. See Lufthansa.

DIRECÇAO DE EXPLORAÇAO DOS TRANSPORTES AÉREOS. See DETA.

DIRECÇAO DE EXPLORAÇAO DOS TRANSPORTES AÉREOS. D.T.A., which has been operating since 1940, is the Government-owned airline in Angola (Portuguese West Africa). With a fleet of seven Douglas DC-3s, four Beech 18s and a D.H. Rapide, it operates domestic services and internationally to the Congo.

Address: Uniao Building, Avenida Paulo Dias de Novais, 79/81 (P.O.B. 79), Luanda.

D.T.A. See Direcçao de Exploraçao dos Transportes Aéreos.

E.A.A. See East African Airways Corporation.

EAST AFRICAN AIRWAYS CORPORATION. A Government-sponsored airline, E.A.A.C. operates in close collaboration with B.O.A.C., flying two Comet 4s between Nairobi and London. Other international services are flown with the Comets and four ex-B.O.A.C. Argonauts, to Bombay, Aden, Durban, Salisbury and Johannesburg, and nine DC-3s are used for service in Kenya, Uganda, Tanganyika and Zanzibar. A third Comet 4 is on order.

Address: P.O.B. 19002, Embakasi, Nairobi, Kenya.

EAST ANGLIAN FLYING SERVICES LTD. See Channel Airways.

EASTERN AIR LINES. This company flies more passengers annually than any other American airline, averaging nearly one million a month. Its 18,000-mile route network is principally on the east side of the continent and north and south in direction; foreign points served are Mexico City, Puerto Rico, Bermuda and Montreal. Eastern Airlines shared with American the introduction into service of the Lockheed Electra, of which it has 39, and was first to use the Douglas DC-8 Srs. 20, of which it has 16. Also used are 48 Douglas DC-7Bs, seven DC-6Bs, 30 Lockheed Super Constellations, 45 Martin 404s and 20 Convair 440s, with 15 Boeing 720-025s and 40 Boeing 727s on order.

This Caravelle III is one of the latest additions to Finnair

Address: 10 Rockefeller Plaza, New York 20, N.Y., U.S.A.

EAST-WEST AIRLINES LTD. This Australian airline flies between Brisbane and Sydney and points in Southern Queensland and N.S.W. The fleet comprises a single Fairchild F-27 (leased from T.A.A.) and four Douglas DC-3s.

Address: P.O.B. 249, Tamworth, N.S.W., Australia.

EL AL ISRAEL AIRLINES LTD. El Al was formed in 1948, with the Israel Government as a major shareholder, soon after the state of Israel was founded. Services to Europe were first operated in 1949, and now extend through London to New York, and to Cyprus, Iran, Johannesburg and Turkey. Three Boeing 707-458s will be delivered in 1961/62 and El Al leased a 707-441 from Varig to start services in January 1961. The remainder of the fleet comprises four Britannia 313s (El Al was the first non-British Britannia operator) and four Lockheed L-049 Constellations.

Address: 76 Maze Street, Tel Aviv, Israel.

ELIPADANA. Societa Alta Italia Transporti Elicotteri, operating as Elipadana, was formed in 1960 and operated on two routes, from Milan to Turin and to Lugano, during the summer season with Sikorsky S-58 helicopters chartered from Sabena and a Vertol 44 chartered from the makers. It is expected to resume operations in the summer of 1961.

ELIVIE. One of three Italian helicopter operators, Societa Italiana Esercizio Elicotteri is associated with Alitalia and flies seasonal services from Naples to Capri and Ischia with five Agusta-Bell 47Js.

Address: Viale Maresciallo Pilsudski 92, Rome, Italy.

ELLIS AIR LINES. This Alaskan carrier operates local services, and one international route across the border from Ketchikan to Prince Rupert in British Columbia. The fleet comprises nine Grumman Goose amphibians and a Catalina.

Address: P.O.B. 1059, Ketchikan, Alaska.

EMPRESA DE VIACAO AERIA RIO GRANDENSE. See VARIG.

EMPRESA GUATEMALTECA DE AVIACION. See Aviateca.

ETHIOPIAN AIR LINES. Although wholly owned by the Ethiopian Government, this company is managed by T.W.A. under contract. Since 1946, its aircraft have been drawn largely from the T.W.A. fleet and now comprise three Douglas DC-6Bs, seven DC-3s and two Convair 240s, with two Boeing 720-060Bs on order for delivery later in 1961. In addition to domestic routes, Ethiopian Air Lines flies to certain points in Europe, the Middle East and Africa.

Address: P.O.B. 1755, Addis Ababa, Ethiopia.

FAUCETT. See Compania de Aviacion " Faucett " S.A.

FIJI AIRWAYS LTD. Jointly-owned by B.O.A.C., Qantas and TEAL, Fiji Airways uses two de Havilland Herons, an Australian D.H. Drover and an amphibious de Havilland Beaver to fly local services in the Fiji islands and to other groups in the Pacific.

Address: Victoria Arcade, Suva, Fiji.

FINNAIR. This is the operating name of Aero O/Y, the Finnish airline founded in 1923. A programme of expansion began in 1947, since when the milestones have been the introduction of Convair 340s in 1953, the inauguration of a service to Moscow in 1956 and the purchase of Caravelles in 1960. Finnair now has four Caravelles (with a fifth on order), six Convair 440s and nine Douglas DC-3s.

Address: 4 Toolonkatu (P.O.B. 278), Helsinki, Finland.

FLUGFELAG ISLANDS H.F. See Icelandair.

FLYING TIGER LINE INC. One of America's leading all-freight airlines, Flying Tiger flies scheduled and non-scheduled cargo operations and also some non-scheduled passenger charters. To its fleet of 14 Lockheed L-1049H Super Constellation freighter convertibles, ten Canadair CL-44D-4 swing-tail freighters were being added during 1961.

Address: Lockheed Air Terminal, Burbank, California, U.S.A.

FRONTIER AIRLINES INC. One of the American local-service carriers since the end of 1946, Frontier serves about 70 cities in the Rocky Mountain and Great Plain areas. Equipment comprises five Convair 340s and 25 Douglas DC-3s.

Address: Stapleton Airfield, Denver 7, Colorado, U.S.A.

GARUDA INDONESIAN AIRWAYS, P.T. This company was set up jointly by K.L.M. and the Indonesian Government in 1950 to take over the former K.L.M. and K.N.I.L.M. services in the Dutch Indies. Since 1958 it has been wholly Indonesian-owned and operated, flying domestic services and internationally to Singapore, Kuala Lumpur, Siam and the Philippines. In addition to three Lockheed Electras delivered in 1961, Garuda flies three Convair 440s, eight 340s and eight 240s, and 17 Douglas DC-3s.

Address: Djalan Nusantara 17, Djakarta.

GESELLSCHAFT FUR INTERNATIONALEN FLUGVERKEHR m.BH. See Interflug.

GHANA AIRWAYS LTD. Formed as the national airline following Ghana's independence, this company flies domestic and local African services with two DC-3s and two Herons and has plans for large-scale expansion in the next year or two. Britannias were chartered from B.O.A.C. for the service from Accra to London, but from December 1960 have been replaced by two Britannias purchased by Ghana Airways. Three Viscount 838s are on order for delivery in 1961, and the first of six Ilyushin Il-18s was delivered in December 1960. Two Boeing 707-420s have been ordered for 1962 delivery followed by three Vickers VC10s in 1964.

Address: Ghana House, P.O.B. 1636, Accra, Ghana.

Ghana Airways' remarkably assorted fleet includes two Herons

GIBRALTAR AIRWAYS LTD. This company is jointly owned by a local shipping concern and B.E.A. Its services between Gibraltar and Tangier are now flown by B.E.A. with Viscount 700s.

Address: Cloister Building, Gibraltar.

GOLDEN GATE AIRWAYS. This tiny airline flies scheduled services from San Francisco to San Carlos and Lake Tahoe with a Beechcraft D18S.

Address: 715 Marin Street, Vallejo, California, U.S.A.

GOLDEN ISLES AIRLINES. This company has a small network of services out of Tampa, Florida, operated by de Havilland Doves.

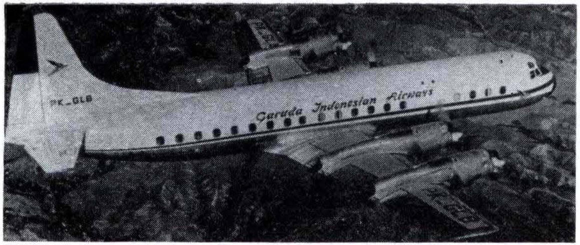
Address: St. Simons Island, Georgia, U.S.A.

GUEST AEROVIAS MEXICO S.A. Smallest of the three Mexican international airlines, Guest takes its name from its founder, Winston Guest. It operates across the central Atlantic to Lisbon, Madrid and Paris, to Miami, and to Panama and Venezuela. The fleet comprises three Lockheed L-1049G Super Constellations, two L-749s, three Douglas DC-6s, a DC-4 and a Fairchild C-82. Two Comet 4Cs were chartered from Mexicana for international services in the Spring of 1961.

Address: Paseo de la Reforma 51, Mexico City.

GUINEA AIRWAYS PTY. LTD. This company was formed late in 1960 as a wholly-owned subsidiary of Ansett-A.N.A. to operate local services in Papua and New Guinea. The start of operations depends, however, on the granting of a licence for these services by the Australian Government.

GULF AVIATION CO. LTD. A wholly-owned subsidiary of B.O.A.C., Gulf Aviation flies services in the Persian Gulf area from Bahrain in addition to local charter flying. The



Garuda Indonesian Airways received three Electras in 1961

fleet comprises two Douglas DC-3s, four de Havilland Herons and three Doves.

Address: Speedbird House, Manama, Bahrain Island, Persian Gulf.

HAWAIIAN AIRLINES. One of the two airlines operating services in the Hawaiian islands, this company was founded early in 1929 and operated originally with Sikorsky amphibians. Its fleet now comprises two Douglas DC-6s, eight Convair 440s, five DC-3s (" Viewmasters ", with special panoramic windows) and two all-freight C-47s.

Address: International Airport, Honolulu, Hawaii.

IBERIA. The State-owned Spanish carrier, Lineas Aereas de Espana, operates to South, Central and North America, to North and West Africa, to many points in Europe and domestically. The fleet will be modernised in 1961 with three Douglas DC-8 Srs. 50s and four Caravelles; in addition Iberia has seven Lockheed L-1049E/G Super Constellations, seven Convair 440s, 21 Douglas DC-3s and DC-4s and four Bristol 170s.

Address: Avenida America 2, Madrid, Spain.

ICELANDAIR. This is the operating name of Flugfelag Islands H.F., one of the two Icelandic airlines. With two Vickers Viscount 759s, a Douglas DC-4, three DC-3s and a Catalina, Icelandair flies to Glasgow, London, Hamburg, Oslo and Copenhagen.

Address: Reykjavik Airport (P.O.B. 1426), Reykjavik, Iceland.

ICELANDIC AIRLINES. Domestic and international services are flown by this company (Loftleidir H.F.) including a low-fare transatlantic service with two Douglas DC-6Bs and two DC-4s.

Address: Laekjargata 2, P.O.B. 476, Reykjavik, Iceland.

INDIAN AIRLINES CORPORATION. This company was founded in 1953 to become India's domestic airline. In addition to a large route network within India, I.A.C. operates to Afghanistan, Burma, Ceylon, Nepal and Pakistan, with a fleet of ten Viscount 768s, five Fokker F-27s, five Douglas DC-4s, 58 DC-3s and 12 Vickers Vikings.

Address: Thapar House, Janpath, New Delhi, India.

INI AIRLINES. A comparatively new Argentinian airline, Aerolineas Ini y Cia S.A. flies internationally from Buenos Aires to Miami through Chile, Peru, Ecuador and Panama. The fleet includes Douglas DC-6s and DC-4s, with DC-6Bs on order.

Address: Corrientes 1994, Buenos Aires, Argentina.

INLET AIRLINES INC. This company flies local services in Alaska, between Anchorage and Seldovia. Its fleet includes Douglas DC-3, Lockheed 10E, de Havilland Dove and Heron and Beechcraft D.18S.

Address: P.O. Box 6-244, Anchorage, Alaska.

INTERFLUG. This company was set up in East Germany in 1958, apparently to fly international charters on behalf of Deutsche Lufthansa. It also flies a scheduled service from East Berlin to Budapest, Tirana and Belgrade, apparently sharing the Deutsche Lufthansa Ilyushin Il-18s and Il-14s.

Address: Franzosische Str. 53–56, Berlin W. 8, German Democratic Republic.

IRANAIR. See Iranian Airways.

IRANIAN AIRWAYS. Usually known as Iranair, this company flies a network of local routes in Persia, and services to other cities in the Middle East, Afghanistan, Pakistan and Europe. The fleet comprises three Vickers Viscount 782s, two Douglas DC-4s and 13 DC-3s.

Address: Avenue Saadi, Teheran, Persia.

IRAQI AIRWAYS. A subsidiary of the Iraqi State Railways, Iraqi Airways has been flying services in the Middle East since 1946 and has since extended its area of operation to Prague Budapest, London and Delhi. The fleet comprises four Vickers Viscount 735/773s and a de Havilland Dove.

Address: Iraqi Republic Railways, Baghdad West, Iraq.

IRISH INTERNATIONAL AIRLINES. This is the operating name of Aerlinte Eireann, a sister company of Aer Lingus owned by Aer Rianta. Transatlantic services are flown by three Boeing 720-048s which have succeeded the Lockheed L-1049H Super Constellations previously leased, with crews, from Seaboard and Western.

Address: 43 Upper O'Connell Street, Dublin, Eire.

ISRAEL AIRLINES. See El Al.

ISRAEL INLAND AIRLINES. See Arkia.

ITAVIA. This is the operating name of a small Italian company, Societa di Navigazione Aerea S.p.A., which started operations in July, 1959. With a D.H. Dove and six Herons, it now flies on routes from Rome to Pescara, Siena and Genoa.

Address: Aeroporto dell'Urbe, Via Salaria, Rome, Italy.

JAPAN AIR LINES CO. LTD. The first airline formed in Japan after World War II, J.A.L. originally relied upon help from Northwest Airlines, but has been independent since 1953, with the Government holding 50% of the shares. In addition to domestic services, J.A.L. flies internationally in the Far East and to the U.S. West Coast, and plans a service to Europe via a Polar route and another through India in 1961/62. Equipment comprises four Douglas DC-8 Srs. 30s, four Douglas DC-7Cs (two converted to DC-7F freighters), five Douglas DC-6Bs, ten Douglas DC-4s. Five Convair 880-Ms are on order, the first three being scheduled for delivery in June 1961, and the r emaining two in May 1962.

Address: Tokyo Building, 3 2-Chome Marunouchi, Chiyoda-ku, Tokyo, Japan.

JERSEY AIRLINES. Founded in 1948, this company is associated with B.E.A. and operates on a network of routes spreading out from the Channel Islands to points in the U.K. and Northern France. Its fleet comprises eight Douglas DC-3s, four D.H. Herons and a Rapide, with six Handley Page Herald 201s on order for delivery in 1961 and 1962.

Address: States Airport, Jersey, Channel Islands.

JUGOSLOVENSKI AEROTRANSPORT. The Government-owned J.A.T. was formed in 1947 to take control of all Jugoslav air transport operations. It flies domestic and international services in Europe, with a Douglas DC-6B, six Ilyushin Il-14s, 13 Douglas DC-3s, two Convair 440s and a 340.

Address: Bircaninova 1/iii, Belgrade, Jugoslavia.

KARHUMAKI AIRWAYS. This company—Kar-Air O/Y—has been operating domestic services in Finland since 1950, and also flies one international route, to Stockholm. The fleet comprises three Douglas DC-3s, two Convair 440s and a Lockheed Lodestar.

Address: Lonnrotinkatu 3, Helsinki, Finland.

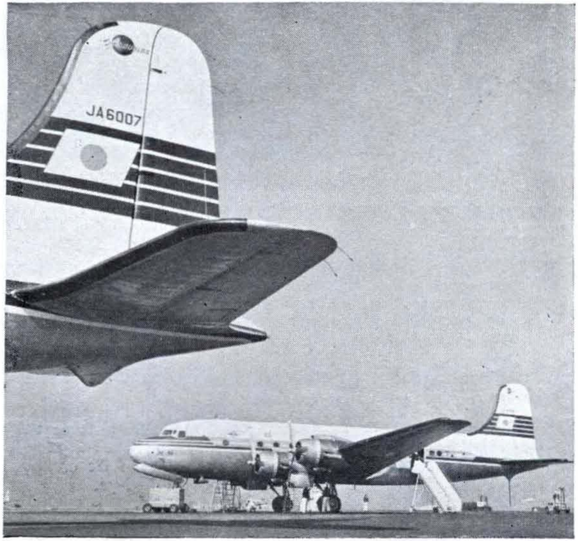
K.H.S. AIR FREIGHT SERVICE. Using Twin Beechcraft, this company flies scheduled cargo services over routes between Chicago and Detroit. It was founded by Kellog Hangar Service Inc. at Kellog Field, Battle Creek.

Address: 3037 Dickman Road, Battle Creek, Michigan, U.S.A.

K.L.M. ROYAL DUTCH AIRLINES. One of the best-known World airlines, K.L.M. celebrated its 40th birthday in 1959, making it the oldest airline still in business. The Netherlands Government is now the majority shareholder. Services are flown locally, throughout Europe, to the Far East, to North, Central, and South America and the Caribbean, to South Africa and to Australia. The fleet comprises seven Douglas DC-8 Srs. 30s (plus six DC-8 Srs. 50s for delivery in 1961); 13 DC-7Cs, five DC-6A/Bs, six DC-6s, nine DC-3s, 12 Lockheed Electras (one leased to Air Ceylon), nine Vickers Viscount 803s, 14 Lockheed L-1049E/G/H Super Constellations, two DC-7Fs, ten Convair 340s and two Fokker F-27s (leased to Iraq Petroleum).

Address: Plesmanweg 1, The Hague, Holland.

Japan Air Lines operates ten Douglas DC-4s in the Far East



The Douglas DC-3 is, despite its age, still the world's most widely-used transport, that illustrated belonging to Lake Central

KONINKLIJKE LUCHTVAART MAATSCHAPPIJ N.V. See K.L.M.

KOREAN NATIONAL AIRLINES. The airline of South Korea was formed in 1947 by the Ministry of Transport and resumed operations in 1952 after the end of the Korean War. It operates domestically and to Hong Kong with a Lockheed L-749 Constellation, a Douglas DC-4 and three Douglas DC-3s.

Address: No. 1 First Street, Chyong-no District, Seoul, Korea.

KUWAIT AIRWAYS. An associate of B.O.A.C., Kuwait Airways has been operating services throughout the Middle East and to Pakistan and India since 1953. The fleet comprises four Viscount 702/761s and two Douglas DC-3s.

Address: P.O.B. 394, Kuwait, Persian Gulf.

L.A.A. See Los Angeles Airways,

LACSA. The only Costa-Rican airline, Lineas Aereas Constarricenses S.A. is affiliated with Pan American and partly Government-owned. With three Douglas DC-3s, four Curtiss C-46s and two Convair 340s, it flies local services in Costa Rica and internationally to Miami, Cuba, Caymen, Mexico and Panama.

Address: Avenida Ia y Calle 3a (Apartado 1531), San Jose, Costa Rica.

L.A.D.E. See Lineas Aereas des Estado.

LADECO. This privately-owned airline was formed in 1958 to operate local services in northern Chile, principally between Santiago and the centres of the copper-mining industry. The full name is Linea Aerea del Cobre Ltda. and the fleet consists of two Douglas DC-3s.

Address: Amunategui 73, Santiago de Chile.

LAKE CENTRAL AIRLINES INC. One of the smaller U.S. local service airlines, Lake Central has been flying scheduled passenger services since the end of 1949 in the area south of Lake Erie. The fleet comprises 12 DC-3s.

Address: Weir Cook Airport, Indianapolis 44, Indiana, U.S.A.

LAN. Linea Aerea Nacional is a Government-owned operator in Chile, flying domestic services and to Argentina, Bolivia, Panama, Peru, Uruguay and Miami in the U.S.A. The fleet comprises seven Douglas DC-6s, 17 DC-3s and four Martin 202s.

Address: Los Cerrillos Airport, Santiago de Chile.

L.A.N. See Loide Aereo Nacional S.A.

LANICA. Lineas Aereos de Nicaragua is an associate of Pan American, which has a 40% interest. It operates local services in Nicaragua with a Vickers Viscount 786, seven Douglas DC-3s and two Curtiss C-46s.

Address: Apartado Postal No. 753, Managua, Nicaragua.

LAUSA. See Lineas Aereas Unidas S.A.

L.A.V. Usually known by its initials, Linea Aeropostal Venezolanas is state-owned and now flies domestic services only. The fleet includes five Vickers Viscount 749s, 19 Douglas DC-3s, two Martin 202s and four Curtiss C-46s.

Address: Bloque 1, El Silencio, Caracas, Venezuela.

LEAVENS BROTHERS LTD. With two Cessna T-50 twin-engined transports, this company maintains a scheduled service between Windsor, Ontario, and Pelee Island.

Address: 3220 Dufferin Street, Toronto 19, Ontario, Canada.

LEBANESE INTERNATIONAL AIRWAYS. Services were started by L.I.A. in 1956, using Curtiss C-46s on a route from Beirut to Kuwait. Services are now flown to several points in the Middle East and to Milan, Paris and Brussels in Europe, using a Douglas DC-6 and two DC-4s.

Address: Zabbat Building, Justinien Street, Beirut, Lebanon.

LEEWARD ISLANDS AIR TRANSPORT SERVICES LTD. A part-owned associate of B.W.I.A., which holds 51% of the shares, this company flies local services among the islands of Anguilla, Antigua, Barbados, Grenada and Trinidad in the British West Indies. Its fleet comprises two de Havilland Herons, two Beech Twin Bonanzas and a Piper Apache.

Address: St. Mary's Street, St. John's, Antigua.

LIBERIAN NATIONAL AIRWAYS. Formed by the Liberian Government in 1949, this company uses two DC-3s to fly local services in Liberia.

Address: Robertsfield, Liberia.

LIBIAVIA. This is the operating name of Nord African Aviazione, which has been operating between Tripoli, Athens and Ankara since 1958. Douglas DC-6A and DC-6B equipment is chartered from the French U.A.T.

Address: 218 Giaddat Istiklal, P.O.B. 245, Tripoli, Libya.

LIGNES AERIENNES INTERIEURES. See Air Inter.

LINEA AEREA DEL COBRE LTDA. See LADECO.

LINEA AEREA NACIONAL. See LAN.

LINEA AEROPOSTAL VENEZOLANAS. See L.A.V.

LINEA INTERNACIONAL AEREA S.A. This small company flies locally between Guayaquil and Quito.

Address: 456 VM Rendon, Guayaquil, Ecuador (Apartado 21).

LINEAS AEREAS CHAQUENAS SOC. DE ECON. MIXTA. See Aero Chaco.

LINEAS AEREAS CONSTARRICENSES S.A. See LACSA.

LINEAS AEREAS DE CUYO. See TACA.

LINEAS AEREAS DE ESPANA. See Iberia.

LINEAS AEREAS DES ESTADO. Usually known as LADE, this airline was started by the Argentine Air Force in 1940. With two Douglas DC-4s, two DC-3s and two Vickers Vikings, LADE operates services within Argentina linking Buenos Aires, Mar del Plata, Cordoba, Mendoza, Bahia Blanca and other towns.

Address: Corrientes 480, Buenos Aires, Argentina.

LINEAS AEREAS DE NICARAGUA. See LANICA.

LINEAS AEREAS UNIDAS S.A. This Mexican local operator flies a regular service between Mexico City, Tampico and Cacahuatepec.

Address: Izazaga 8-E, Mexico, I.D.F.

LINJEFLYG A.B. This company was set up in 1957 to operate domestic and charter service in Sweden, with S.A.S. holding 50% of the shares and three Swedish publishers sharing the remainder. With five Convair 340/440s and eight Douglas DC-3s, Linjeflyg flies scheduled newspaper runs as well as passenger services.

Address: Bromma Airport, Bromma 10, Stockholm, Sweden.

LLACSA. See Lloyd Aereo Colombiano S.A.

LLOYD AEREO BOLIVIANO S.A. One of South America's oldest airlines, this company was founded in 1925 and became nationally owned in 1941. It flies locally in Bolivia and to Argentina, Brazil and Chile. The LAB fleet includes two Boeing B-17s but these are not used for passenger services, the latter being flown by nine Douglas DC-3s and two DC-4s.

Address: Casilla 132, Cochabamba, Bolivia.

A Sikorsky S-62 of the all-helicopter Los Angeles Airways

LLOYD AEREO COLOMBIANO S.A. Llacsa, as this airline is sometimes known, has been operating since 1954 with three Curtiss C-46s and a Douglas DC-3, on local routes in Colombia and a service to Miami.

Address: Avenida Jimenez No. 5–57 (P.O.B. 4904), Bogota, Colombia.

LOFTLEIDIR H.F. See Icelandic Airlines.

LOIDE AEREO NACIONAL S.A. This Brazilian operator—actually a consortium of three airlines—flies a large domestic network with its fleet of seven Douglas DC-4s, four DC-6s and eight Curtiss C-46s.

Address: Avenida 13 de Maio, 13-27 Andar, Rio de Janeiro, Brazil.

Malev operates three Il-18s on its European network

LONE STAR AIRLINES. From Love Field, Dallas, this company flies a high frequency service over a single route to Houston, using Martin 404s.

Address: Love Field, Dallas, Texas, U.S.A.

LOS ANGELES AIRWAYS INC. This company became the first to operate a scheduled air-mail service with helicopters, in October 1947, and began carrying passengers on these services in 1954. All-passenger services have since been added on a network of routes linking Los Angeles International Airport with outlying residential areas and down-town Los Angeles. With five Sikorsky S-55s and two S-62s, and five S-61s on order, L.A.A. is one of the " big-three " all-helicopter operators.

Address: P.O.B. 10155, Los Angeles Airport, Los Angeles 45, California, U.S.A.

LOT. The original name of the Polish state-owned airline, Polskie Linie Lotnicze, recalls its origin in 1929. The company now flies domestic and European services with three Ilyushin Il-18s, 12 Il-14s, four Convair 240s and 20 Li-2s.

Address: Grojecke 17, Warsaw, Poland.

LUFTHANSA. The name of Lufthansa was revived in West Germany in 1955, when domestic and European services were started by Deutsche Lufthansa Aktiengesellschaft. Subsequently, growth has been rapid, and Lufthansa now flies to North and South America, the Middle East, India, Pakistan and Siam. The fleet comprises five Boeing 707-430s, nine Vickers Viscount 814s, seven Lockheed L-1049G Super Constellations, four L-1649A Starliners, nine Convair 440s, three Douglas DC-3s and eight Boeing 720-030Bs. Twelve Boeing 727s and one additional Viscount 814 are on order.

Address: 1 Claudiusstrasse, Cologne, West Germany.

MACKEY AIRLINES INC. Primarily a local service airline in the Florida area of the U.S.A., Mackey also flies internationally on routes from Florida to the Bahamas and Cuba. Its equipment comprises one Douglas DC-6, three DC-4s, two DC-3s and a Grumman Goose.

Address: Broward County International Airport, Fort Lauderdale, Florida, U.S.A.

MAC-ROBERTSON MILLER AIRLINES LTD. One of the oldest Australian airlines, Mac-Robertson Miller now serves Western Australia and the Northern Territory. In addition to a single Fokker F-27 (leased from T.A.A.) the airline owns six Douglas DC-3s and a de Havilland Dove.

Address: 194 St. George's Terrace, Perth, Western Australia.

MADAIR. A company of this name was formed by the Government of Madagascar early in 1961, following independence, jointly with Air France and Air Madagascar. It will begin operations on domestic services and regionally in October 1961 with Douglas DC-4s, DC-3s and de Havilland Rapides.

MAGYAR LEGIKOZLEKEDESI VÁLLALAT. See MALEV.

MALAYAN AIRWAYS LTD. Both B.O.A.C. and Qantas have a one-third shareholding in this airline, in which the governments of Singapore, Malaya, Sarawak, Brunei and North Borneo, the Straits and Ocean Steamship Co. and private individuals also hold shares. Services are flown throughout the Malay states and to Indonesia, Siam and Hong Kong.

Address: Airways House, Raffles Place (P.O.B. 397), Singapore 1.

MALEV. The Hungarian state airline, Magyar Legikozlekedesi Vallalat is now wholly Hungarian owned, after being jointly owned with Russia until 1954. It flies a local and European network with four Ilyushin Il-18s, nine Il-14s and some Li-2s.

Address: Vörösmarty Ter 5, Budapest, Hungary.

MALTA AIRWAYS CO., LTD. Associated with B.E.A., which has a 34% interest, Malta Airways has no fleet of its own. Its routes are flown by B.E.A. aircraft and crews.

Address: 285 Kingsway, Valetta, Malta.

MANDATED AIRLINES LTD. Local services are flown by Mandated from Lae in New Guinea. The fleet comprises five Douglas DC-3s. The company became a wholly-owned subsidiary of Ansett-A.N.A. early in 1961.

Address: P.O.B. 25, Lae, North-East New Guinea.

MARITIME CENTRAL AIRWAYS LTD. From its headquarters on Prince Edward Island, M.C.A. flies services to New Brunswick, Nova Scotia, Quebec, Newfoundland, Labrador and the Northwest Territories. The company has an ex-Eagle Viscount 805, a Douglas DC-4, four DC-3s and four Curtiss C-46s in addition to some single-engined aircraft. Two Herald 200s are on order.

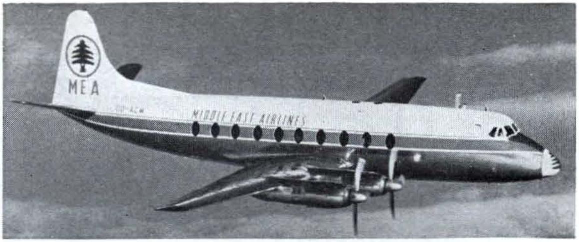
Address: Charlottetown, Prince Edward Island, Canada.

MATANE AIR SERVICE LTD. With a Douglas DC-3, four Lockheed 10 Electras and a Cessna T-50, this local operator flies scheduled services across the St. Lawrence River at Matane, and other routes in the area.

Address: P.O.B. 700, Matane, Quebec, Canada.

M.C.A. See Maritime Central Airways.

M.E.A. See Middle East Airlines.



A Vickers Viscount 732 of Middle East Airlines

MEXICANA. At one time wholly owned by Pan American, Cia Mexicana de Aviacion S.A. is still an associate of the U.S. airline which has a 42% interest. In addition to a domestic network, Mexicana flies to points in the west and centre of U.S.A. and to Havana. The fleet includes three de Havilland Comet 4Cs (Mexicana was the first to purchase and operate this version), eight Douglas DC-6s, seven DC-4s, 12 DC-3As and four C-47s, and four Fairchild C-82s.

Address: Balderas No. 36 (Apartado Postal 901), Mexico City.

MIDDLE EAST AIRLINES CO. S.A. M.E.A. was formed privately in 1945, was assisted by Pan American from 1949 to 1955, and then became an associate of B.O.A.C. which now has a 49% interest. Services are flown throughout the Middle East, to Cairo and Pakistan, through Europe to London, and into Turkey. The fleet comprises four de Havilland Comet 4Cs, seven Vickers Viscount 732/754s and four Douglas DC-3s.

Address: Maktabi Building, Omar Ben Abdul Aziz Street (P.O.B. 206), Beirut, Lebanon.

Mexicana operates four Fairchild C-82s on domestic routes

MISRAIR. See United Arab Airlines.

MOHAWK AIRLINES INC. This U.S. local service operator has been flying scheduled services since 1945 (originally as Robinson Airlines) and now serves 36 cities in the north-east of the U.S.A. Its fleet comprises five Convair 440s, seven Convair 240s and eight Douglas DC-3s.

Address: Oneida Country Airport, Utica, New York, U.S.A.

MONGOLIAN AIRLINES (UVS-MNR). The Air Transport Administration of the Mongolian People's Republic, Mongolian Airlines flies in co-operation with Aeroflot between Ulan-Bator and Irkutsk, and from Ulan-Bator to Peking. The fleet at present comprises Ilyushin Il-14s.

Address: The Airport, Ulan-Bator, Mongolian People's Republic.

MT. COOK AIR SERVICES LTD. This company plans to inaugurate " Scenic Services " with DC-3s before the end of 1961, in New Zealand's South Island, flying between Christchurch, Mt. Cook, Queenstown and Te Anan.

N.A.C. See New Zealand National Airways Corporation.

NAPLES AIRLINES. The Naples from which this airline takes its name is that in Florida; using a Lockheed 10A Electra and a Cessna T-50, the airline flies twice daily between Naples and Miami.

Address: Naples America Airport, Naples-on-the-Gulf, Florida, U.S.A.

New York Airways is receiving ten Boeing-Vertol 107-IIs

NATIONAL AIRLINES INC. One of the major U.S. long-haul carriers, National was formed in 1934 for regional operations. Its route network now extends north and south between Boston, New York, Miami and Havana, and as far west as New Orleans and Houston. The fleet includes four Lockheed L-1049H Super Constellations, nine Douglas DC-7/7Bs, eight DC-6Bs, four DC-6s, six Convair 440s, 23 Lockheed Electras and three Douglas DC-8 Srs. 20s. In the winter of 1958/59 and 1959/60, National leased Boeing 707-120s from Pan American, becoming the first airline to use this type on domestic U.S. operations. Seven DC-8 Srs. 50s are on order.

Address: P.O.B. NAL, International Airport, Miami 59, Florida, U.S.A.

NAVEGACAO AEREA BRASILEIRA. From Rio de Janeiro, this Brazilian airline flies a number of local services to Belo Horizante, Brasilia, Vitoria, Salvador, Recife, Fortaleza and other towns, using a fleet of 12 Douglas DC-3s.

Address: Santos Dumont Airport, Rio de Janeiro, Brazil.

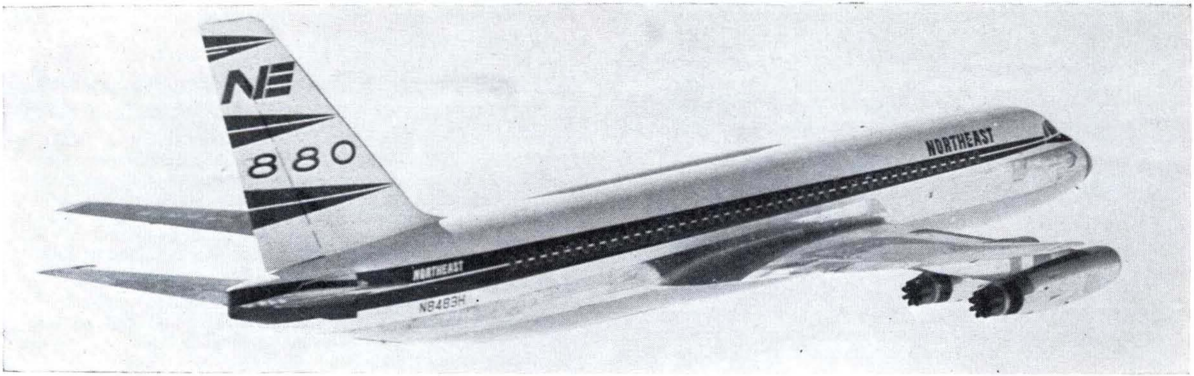
NEW YORK AIRWAYS INC. This was the first airline in the U.S.A. to fly scheduled passenger services with helicopters, starting in July 1953, and is now one of the " big three " helicopter airlines. With a fleet of five Vertol 44Bs, to be progressively replaced by ten Boeing-Vertol 107-IIs from April 1961, it flies a high-frequency service between New York's three airports, two down-town heliports and points in Connecticut, New Jersey and New York State.

Address: P.O.B. 426, La Guardia Airport Station, Flushing 71, New York, U.S.A.

NEW ZEALAND NATIONAL AIRWAYS CORPORATION. The principal New Zealand airline, N.A.C. flies services within and between the two islands. The fleet comprises three Vickers Viscount 807s, eight Fokker F-27s, 26 Douglas DC-3s, one de Havilland Heron and two Dragon Rapides.

Address: P.O. Box 96, Wellington C.1, New Zealand.

NIGERIA AIRWAYS. When Ghana became independent in 1958, it withdrew from the former West African Airways Corporation, which was then re-formed as WAAC (Nigeria) Ltd., operating as Nigeria Airways, in which B.O.A.C. has a 17% interest. The company has seven Douglas DC-3s for local services in Nigeria and to neighbouring African states, and charters Britannias from B.O.A.C. for a service between Lagos and London.



The Convair 880 Model 22 began passenger services in May 1960, that illustrated above belonging to Northeast Airlines

Address: Airways House, Lagos Airport (P.O.B. 136), Lagos, Nigeria.

NORD AFRICAN AVIAZIONE. See Libiavia.

NORDAIR LTD. In mid-1960 this Montreal operator purchased Wheeler Airlines' heavy transport division, including the transport aircraft and route rights. The company now flies services from Montreal to Quebec and other cities in north-east Canada. Equipment includes six Douglas DC-4s and seven DC-3s, five Curtiss C-46s and six Canso amphibians.
Address: Montreal Airport, Montreal, P.Q., Canada.

NORSUR. Another small Argentinian operator, this company—Cia Argentina de Aeronavegacion C.I.F.S.A.—uses eight Lockheed 18 Lodestars to fly a series of local services in northern Argentina from Buenos Aires.
Address: Av. Leandro N. Alem 675, Buenos Aires, Argentina.

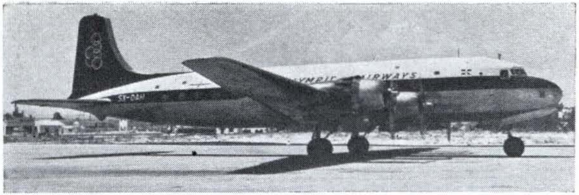
NORTH CENTRAL AIRLINES INC. This company changed its name from Wisconsin Central Airlines in 1952, when the headquarters were moved to Minneapolis. As a local service airline, it now serves 70 points in nine states in the Great Lakes area. The fleet comprises 32 Douglas DC-3s and five Convair 340s.

Address: 6201 34th Avenue South, Minneapolis 50, Minnesota, U.S.A.

NORTHEAST AIRLINES INC. As Boston-Maine Airways, this airline was the first to serve the New England area of the U.S.A. It has since grown to be one of the regional trunk carriers, operating between Miami in the south and Montreal in the north via New York and Boston. Its fleet comprises six Convair 880s, ten Viscount 745s, eleven Douglas DC-3s and ten DC-6Bs.
Address: Logan International Airport, Boston 28, Massachusetts, U.S.A.

NORTHERN CONSOLIDATED AIRLINES INC. This company's name is a reminder of its origin, through a merger between four small operators in Alaska. It now flies scheduled and non-scheduled services domestically in Alaska, chiefly south of Anchorage and Fairbanks. Its fleet includes three Fairchild F-27B passenger/freight convertibles, a Douglas DC-3, a Beech 18 and ten Cessna T-50 Bushmasters.
Address: Box 6133, International Airport, Anchorage, Alaska.

NORTHERN WINGS LTD. From Seven Islands, on the northern bank of the Lawrence River estuary, this company



Olympic Airways' fleet includes four Douglas DC-6Bs

flies a scheduled service to Burnt Creek, using two Douglas DC-3s.

Address: P.O.B. 458, Seven Islands, P.Q., Canada.

NORTHLAND AIRWAYS. Piper Apaches and Cessna 180s are used by this local operator for services from Auckland.

Address: P.O. Box 6226, 68 Victoria Street, W. Auckland, N.Z.

NORTH–SOUTH AIRLINES LTD. This small British independent operator flies between Leeds/Bradford and points in south-west England, with a D.H. Heron. A Handley Page Herald has been ordered for delivery in 1961.

Address: Leeds-Bradford Airport, Yeadon, Yorks.

NORTHWEST AIRLINES INC. One of the few U.S. airlines operating over long stage lengths both internationally and within the U.S.A., Northwest has been in business since 1926. It flies transcontinental services from New York and Washington to Portland and Seattle, over routes from Miami north-west to Chicago and beyond, and internationally from the U.S. West Coast to Alaska, Canada, Hawaii, Japan, Korea, Okinawa, Formosa and the Philippines. Equipment includes five Douglas DC-8 Srs. 30s, nine Lockheed Electras, 24 Douglas DC-6Bs, 14 DC-7Cs, 12 DC-4s and three Boeing Stratocruisers. Six Boeing 720Bs are on order.

Address: 1885 University Avenue, St. Paul 1, Minnesota, U.S.A.

N.Y.A. See New York Airways.

OLYMPIC AIRWAYS S.A. This company was formed with the help of the Onassis shipping concern in 1957, taking over the routes of the former T.A.E. and Hellenic Airlines. It now operates a domestic network and to points in Europe and the Near East, in close association with B.E.A. The fleet comprises four de Havilland Comet 4Bs, four Douglas DC-6Bs, two DC-4s, and 13 DC-3s. Two Douglas DC-8s are to be delivered in 1961.

Address: 6 Othonos Street, Athens, Greece.

ORYX AVIATION. See Suidwes Lugdiens (Edms) Beperk.

OSTERREICHISCHE LUFTVERKEHRS AKTIENGESELLSCHAFT. See Austrian Airlines.

OVERSEAS AVIATION (C.I.) LTD. Since its formation in 1958, Overseas has expanded rapidly and now has a considerable fleet for charter operations and inclusive tours. The only scheduled operation is between Liverpool and Paris with Vickers Vikings.

Address: 6 York Street, St. Helier, Jersey, Channel Islands.

OZARK AIR LINES INC. A U.S. local service airline, Ozark operates in an area bounded by Chicago, Minneapolis, Indianapolis, Omaha, Nashville and Wichita. Its fleet comprises three Fairchild F-27s and 21 Douglas DC-3s.

Address: Lambert Field, St. Louis 34, Missouri, U.S.A.

P.A.A. See Pan American Airways.

PACIFIC AIR LINES INC. A local service operator flying mostly in California and into Oregon, Pacific previously operated under the name Southwest Airways. Its present fleet comprises six Fairchild F-27s, eight Douglas DC-3s, seven Martin 202s and two Martin 404s.

Address: International Airport, San Francisco, California, U.S.A.

PACIFIC NORTHERN AIRLINES INC. This is an Alaskan operator, although based in Seattle, and was the first to fly scheduled services in Alaska (as Woodley Airways). Services are now flown to the U.S. north-western states as well as domestically from Anchorage. The fleet comprises six L-749 Constellations and three DC-3s, with two Boeing 720s on order.

Address: 400 Norton Building, Seattle 4, Washington, U.S.A.

PACIFIC SOUTHWEST AIRLINES. A small but growing U.S. local service operator, Pacific Southwest uses four Lockheed Electras and four Douglas DC-4s to fly high-frequency, low-fare services along the Californian coast between San Diego, Los Angeles and San Francisco, with connections to Las Vegas.

Address: Lindbergh Field, San Diego, California, U.S.A.

PACIFIC WESTERN AIRLINES LTD. From Vancouver, this company operates a large variety of aircraft types on scheduled services and charter and other operations. The regular services are flown principally by three Douglas DC-4s, five DC-3s and five Curtiss C-46s.

Address: Vancouver International Airport, Richmond, B.C., Canada.

PAKISTAN INTERNATIONAL AIRLINES CORPORATION. Following the partition of India, P.I.A. was formed by the Pakistan Government to take over the fleet and operations of Orient Airways. Services are flown locally in West Pakistan, between West and East Pakistan and to India, Burma, the Middle East and Europe. A Boeing 707-331 has been leased from Pan American since 1960, and the fleet also includes three Vickers Viscount 815s, three Lockheed L-1049Cs and two L-1049H Super Constellations, ten Douglas DC-3s and five Fokker F-27s. Three Boeing 720Bs are on order.

Address: Karachi Civil Airport, Karachi, Pakistan.

PANAGRA. See Pan American-Grace Airways Inc.

PANAIR DO BRASIL. The name of this airline recalls its origin as a subsidiary of Pan American, but the U.S. company now has only a 30% interest. Panair flies international services to Argentina, Uruguay, Paraguay and Chile in South America, and across the South Atlantic to Europe and the Middle East. The fleet comprises two Douglas DC-8 Srs. 30s, four DC-7Cs, four DC-6Cs, and four Consolidated Catalinas.

Address: Santos Dumont Airport, Rio de Janeiro, Brazil.

PAN AMERICAN-GRACE AIRWAYS INC. Jointly owned by Pan American World Airways and W. R. Grace and Co., Panagra operates services between Peru, Bolivia and Chile and, in conjunction with National Airlines and Pan American, from New York and Miami through Panama to points in these countries and in Colombia and Ecuador. The fleet includes four Douglas DC-8 Srs. 30s, six Douglas DC-7Bs, two DC-6Bs and a DC-4.

Address: Chrysler Building, 135 East 42nd Street, New York 17, N.Y., U.S.A.

PAN AMERICAN WORLD AIRWAYS INC. This company originated as the sole U.S. international flag carrier, flying between Key West, Florida, and Havana, Cuba, in 1927, and continues to-day solely as an international airline with no traffic rights between cities within the U.S.A. Its route network now extends around the World from New York across the Atlantic, through Europe and Asia and back to the U.S. West Coast across the Pacific. Polar services are flown from the West Coast to London, and PanAm also operates extensively to South America and Australasia and the Far East. It was the first U.S. airline to fly jet services, with the Boeing 707 in October 1958. The fleet now comprises six Boeing 707-121s and 26 707-321s, 19 Douglas DC-8 Srs. 30s, ten Douglas DC-7Fs, 15 DC-7Cs, seven DC-7Bs, three DC-6As, eight DC-4s and ten cargo DC-4s, two DC-3s and 21 Boeing Stratocruisers. Five Boeing 707-321Bs are on order.

Address: Chrysler Building, 135 East 42nd Street, New York 17, N.Y., U.S.A.

PAN AMERICAN WORLD AIRWAYS INC-TRUST TERRITORY DIVISION. This Pan American division operates a local service in the U.S. Trust Territories in the Pacific, serving the Islands of Guam, Caroline, Palan and Marshall. For this operation, three Grumman SA-16 Albatross amphibians are used.

Address: P.O.B. 542, Agana Field, Guam Island, Marianas Islands, Pacific Ocean.

PARAENSE TRANSPORTES AEREOS S.A. With Curtiss C-46s, Paraense flies stopping services between Rio and Sao Paulo and Belem, via Brasilia and other towns.

Address: Rua 13 de Maio 100/102, Belem, Brazil.

PEGASUS AIRLINES. One of the smaller British independent operators, Pegasus flies a scheduled service between London and Blackpool with a fleet of three Vickers Vikings.

Address: 236 Old Bedford Road, Luton, Beds.

PERSIAN AIR SERVICES. Formed in 1956, in association with Sabena, to fly freight services between the Middle East

Among types operated by Pacific Western are DC-3s and DHC-2s

One of the four Electras of Qantas Empire Airways

and Europe, P.A.S. began scheduled passenger services in June 1960 from Teheran to Paris, Brussels, Geneva and London. A Boeing 707 is chartered from Sabena for one service a week, the P.A.S. fleet comprising two Douglas DC-7Cs and two DC-4s.

Address: Ferdowsi Avenue 114, Teheran, Persia.

PHILIPPINE AIR LINES INC. Since 1954, P.A.L. has flown only domestic services apart from a service to Hong Kong, and serves 72 points within the Philippine Islands. International services were flown between 1946 and 1954, and will be resumed in 1961 with two Douglas DC-8s. The remainder of its fleet comprises three Vickers Viscount 784s, two Fokker F-27s (with a third on order), 27 Douglas DC-3s, four de Havilland Otters and two Scottish Aviation Twin Pioneer Srs. 2s.

Address: M.R.S. Building, Plaza Cervantes, Manila, Philippine Islands.

P.I.A. See Pakistan International Airlines Corp.

PIEDMONT AVIATION INC. Operating as Piedmont Airlines, this U.S. local service airline has been flying a route network between Virginia and N. Carolina and Ohio and Kentucky since early 1948. The fleet comprises eight Fairchild F-27s and 17 Douglas DC-3s.

Address: Smith Reynolds Airport, Winston-Salem 1, N. Carolina, U.S.A.

P.L.A.S. See Primera Linea Aerea Santafesina S.A.

PLUNA. Wholly Government owned, Primeras Lineas Uruguayas de Navegacion Aerea operates domestic services in Uruguay and internationally to Argentina, Brazil and Paraguay, with three Viscount 769s and six Douglas DC-3s.

Address: Colonia 1021, Montevideo, Uruguay.

POLSKIE LINIE LOTNICZE. See LOT.

POLYNESIAN AIRLINES. One of two Samoan operators, Polynesian uses Percival Princes for an 82-mile service connecting Apia with Pago Pago.

Address: Apia, Samoa.

Operating domestic services between seventy-two points within the Philippines, these P.A.L. Otters fly from jungle strips

PRIMERA LINEA AEREA SANTAFESINA S.A. As P.L.A.S., this Argentine airline flies services between Sante Fe and Buenos Aires twice a week with a Lockheed Lodestar.

Address: Vera Esquino, 25 de Mayo, Sante Fe, Argentina.

PRIMERAS LINEAS URUGUAYAS DE NAVEGACION AEREA. See PLUNA.

PROVINCETOWN-BOSTON AIRLINE INC. As the name indicates, this small U.S. airline operates between Provincetown and Boston International (Logan) Airport, a distance of 45 miles, with Lockheed 10A Electras and Cessna T-50 Bobcats.

Address: Municipal Airport, Provincetown, Massachusetts, U.S.A.

QANTAS EMPIRE AIRWAYS LTD. As Queensland and Northern Territory Aerial Services, this company began flying services in Australia in 1922. It collaborated with Imperial Airways on the route to London in 1931 and became the state-owned flag carrier on all international services in 1947. Qantas now operates round the World from Sydney through New York and London, and to points in the Far East and Africa. The fleet comprises seven short-fuselage Boeing 707-138s (with three turbofan-engined -138Bs on order), four Lockheed Electras, eight Lockheed L-1049 Super Constellations, three Douglas DC-4s, eight DC-3s and four de Havilland Otters.

Address: Qantas House, 70 Hunter Street, Sydney (P.O.B. 489), N.S.W.

QUEBECAIR LTD. Originally Rimouski Airlines, this company operates from the city of that name, in Quebec Province, to other points in Eastern Canada. Its fleet includes three Fairchild F-27s, three Douglas DC-3s, two Cansos, a Curtiss C-46 and a Beech 18, and two Canadair 540s. The latter were converted from Convair 440s by Canadair in 1959, prior to the production of Canadian-built 540s.

Address: Rimouski, P.Q., Canada.

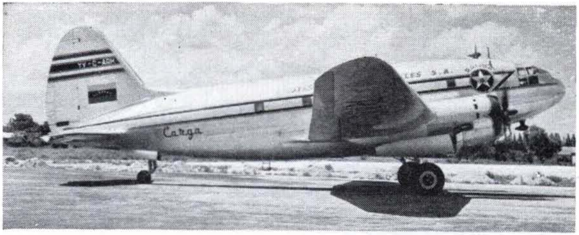
QUEENSLAND AIRLINES PTY LTD. Now associated with Ansett-ANA, this company was founded in 1927 as Aircrafts Pty. Ltd. It now flies with a Fokker F-27 and three Douglas DC-3s within Queensland and New South Wales.

Address: Brisbane Airport, Brisbane, Queensland.

RANSA AIRLINES. This is an all-freight airline—Rutas Aereas Nacionales S.A.—using a fleet of 13 Curtiss C-46s on routes between Miami, Jamaica and Venezuela.

Address: 407 Edificio America, Caracas, Venezuela.

RAS. See Rutas Aereas de Colombia.



The all-freight airline RANSA has a fleet of thirteen C-46s

REAL AEROVIAS BRASILIA-NACIONAL. One of the largest Brazilian airlines, REAL is in fact a consortium, built up since 1946 by absorbing other operators. In addition to the large internal network, REAL flies services to several other South American states and to Trinidad, Miami and Chicago. The fleet includes 78 Douglas DC-3s (the largest fleet of this type in service with a single airline), three DC-4s, 14 Convair 440s and six 340s, 18 Curtiss C-46s, four Lockheed L-1049H Super Constellations and three Convair 990s for delivery in 1961.

Address: Rua Conselheiro Crispiniano 379, Sao Paulo, Brazil.

REEVE ALEUTIAN AIRWAYS INC. This Alaskan carrier has been operating services since 1948 from Anchorage to points in the Aleutian and Pribilof Islands. The fleet includes two Douglas DC-4s and two DC-3s, with two Grumman Goose amphibians for additional flights within the Aleutians.

Address: P.O.B. 559, Anchorage, Alaska.

RESEAU AERIENNE INTERINSULAIRE. Two Catalinas and a Short Sandringham are used by R.A.I. to fly services in the Society Islands, French Oceania.

Address: Messageries Maritimes (P.O.B. 96), Papeete, Tahiti, Society Is.

RIDDLE AIRLINES INC. One of the few U.S. all-freight carriers, Riddle operates regularly between New York and San Juan, and between Miami and Detroit via Atlanta and Chicago. Other activities include a regular service carrying outsize freight between certain U.S.A.F. bases under a MATS Logair contract, for which seven Armstrong Whitworth Argosy freighters were purchased. Delivery of these began at the end of 1960 to make Riddle the first Argosy operator. Remainder of the fleet comprises seven Douglas DC-7Cs, three DC-4s and 30 Curtiss C-46s.

Address: International Airport, Miami, Florida, U.S.A.

ROYAL AIR CAMBODGE. The national airline of Cambodia, Royal Air Cambodge has been flying local services since 1956, and operates to Saigon, Thailand and Hong Kong. It is assisted by Air France and uses one of the latter's Lockheed L-1049G Constellations.

Address: 151 Vithei Dekeho Damdin (P.O.B. 539), Phnom-Penh, Cambodia.

Riddle is the first operator of the A.W.650 Argosy freighter

ROYAL AIR MAROC. This national airline was formed following the granting of independence to Morocco in 1957, to take over the operations of the former private airline C.T.A. Two Caravelles and four L-749 Constellations are used for international services to cities in Europe and North Africa, and two DC-3s and some Beech 18s operate local-area services.

Address: 5 Avenue de l'Armee Royale, Casablanca, Morocco.

ROYAL NEPAL AIRLINE CORPORATION LTD. With three Douglas DC-3s, Royal Nepal flies domestic services and on the route to Calcutta.

Address: Khatmandu, Nepal.

RUTAS AEREAS DE COLOMBIA, LTDA. Sometimes known as R.A.S., this airline began operating local services in Colombia in 1955 and extended to international operations in 1956. It now flies to the Netherlands Antilles, Panama, Miami, Rio de Janeiro and Mexico City, with three Douglas DC-6Bs, three DC-4s and a DC-3.

Address: Apartado Aereo 19–12, Medellin, Colombia.

RUTAS AEREAS NACIONALES S.A. See Ransa Airlines.

S.A.A. See South African Airways.

SABENA. Belgium's flag carrier, Sabena is controlled by a board on which the Belgian Government, private interests and —until 1960—the Congo State are represented. Services are flown throughout Europe, to North America, to North and South Africa and to the Congo Republic. Sabena has also flown a scheduled international helicopter network for the past seven years, on the European mainland. The fleet comprises four Boeing 707-329s, eight Douglas DC-7Cs, eight DC-6Bs, two DC-6As, three DC-6s, five DC-4s, 28 DC-3s and nine Convair 440s, with six Caravelle VIs for 1961 delivery, and six Sikorsky S-58s for the helicopter network.

Address: Air Terminus, Brussels, Belgium.

SADIA S.A. TRANSPORTES AEREOS. Part of the REAL consortium, Sadia operates to about two dozen cities from Rio de Janeiro and Sao Paulo, using two Douglas DC-3s and two Curtiss C-46s.

Address: Rua sao Bento 470, Sao Paulo, Brazil.

SAHSA. The largest of the three Honduras airlines, Servicio Aereo de Honduras S.A. was founded in 1945 with the help of Pan American. In addition to domestic routes, services are flown to British Honduras, Guatemala, Nicaragua and Salvador. The fleet comprises six Douglas DC-3s and two Curtiss C-46s.

Address: Avenida Colon y 4a Calle, Tegucigalpa, Honduras.

S.A.M. See Sociedad Aeronautica Medellin S.A.

SAMOAN AIRLINES. Of U.S. ownership, this is one of two Samoan airlines, flying Douglas DC-3s on the Apia–Pago Pago route, a distance of 92 miles.

Address: 1601 N. Gower Street, Hollywood 28, California, U.S.A.

SAN FRANCISCO-OAKLAND HELICOPTER AIRLINES. Services in the San Francisco–Oakland area were started by this company in April 1961, using two Sikorsky S-62s leased from the makers.

SARNIA AIRLINES. Using de Havilland Doves, this company flies services from Sarnia, at the foot of Lake Huron on the U.S.-Canada border, to Windsor, London and Toronto, all in Ontario.

Address: 1972 London Road, Sarnia, Ontario, Canada.

S.A.S. See Scandinavian Airlines System.

SASKATCHEWAN GOVERNMENT AIRWAYS. This airline was formed in 1947 by the Provincial Government in Saskatchewan to fly scheduled and non-scheduled services in the northern part of the Province. The fleet includes two Douglas DC-3s and a variety of single-engined types.

Address: The Airport, Prince Albert (P.O.B. 850), Saskatchewan, Canada.

SATGA. See Societe Aerienne de Transport Guyane Antilles.

SAUDI ARABIAN AIRLINES. Although owned by the Saudi Arabian Government, this airline is managed by T.W.A. In addition to domestic services, it flies to a number of points in North Africa and the Middle East. The fleet comprises ten Convair 340s, four Douglas DC-4s, ten DC-3s, and, for freight carrying, five Bristol 170s.

Address: P.O.B. 167, Jeddah, Saudi Arabia.

SAVAG. This company, Viacas Aerea Gaucha, is a subsidiary of Cruzeiro, which provides crews and technical help. Services are flown locally in Brazil between Rio Grande, Porto Alegre, Bage and Erechim, using six Douglas DC-3s.

Address: Edifico Camara do Comercio, Rio Grande, Rio Grande do Sul, Brazil.

SCANDINAVIAN AIRLINES SYSTEM. This three-nation airline (Sweden, Denmark and Norway) was formed in 1948 to operate transatlantic services but later assumed responsibility for all the operations of the three founder airlines, D.D.L., D.N.L. and A.B.A. Its origin is still reflected by the division of its fleet registrations among the three countries. S.A.S. now operates an extensive European network, many transatlantic services, routes to the Far East including the Copenhagen–Tokyo Polar route which was pioneered by this airline, and to South America, the Middle East, India and South Africa. The fleet comprises seven Douglas DC-8 Srs. 30s, 14 DC-7Cs, nine DC-6As, 14 Sud Caravelles, 20 Convair 440s, two Viscount 779s on lease and, on order, two Convair 990 Coronados.

Address: Bromma Airport, Bromma 10, Stockholm, Sweden.

SEABOARD WORLD AIRLINES INC. The only U.S. all-freight airline flying scheduled services across the North Atlantic, Seaboard World Airlines also maintains a small fleet of aircraft for services within Germany, and until the end of 1960 operated Irish International Airlines' North Atlantic passenger services under charter. The fleet comprises nine Lockheed L-1049 Super Constellations, three DC-4s, two DC-3s and a Curtiss C-46. Five Canadair CL-44D-4s are to be delivered in 1961.

Address: International Airport, Idlewild, New York, U.S.A.

Belgium's flag carrier, Sabena, operates a helicopter network with six Sikorsky S-58s, two of which are seen below

Silver City is one of the very few operators of the Hermes 4

SEA-TAC AIRWAYS INC. Formed early in 1960, Sea-Tac flies Sud-Aviation Alouette II helicopters, a Beech TravelAir and a Grumman Super Widgeon on regular services between Seattle-Tacoma International Airport and the centre of Seattle with an intermediate stop in residential Bellevue. It shares with Air Florida Helicopter Airways the distinction of being the first to operate turbine-powered helicopters on regular services.

Address: Administration Building, Seattle-Tacoma International Airport, Seattle 88, Washington.

SERVICIO AEREO DE HONDURAS S.A. See SAHSA.

SERVICO DE TRANSPORTES AEROS. This small carrier operates regular services with two de Havilland Rapides between the islands of Sao Tome and Principe in the Gulf of Guinea off the West African coast.

Address: The Airport, Sao Tome Island, Gulf of Guinea.

SERVICOS AEREOS CRUZEIRO DO SUL LTDA. See Cruzeiro do Sul.

SIERRA LEONE AIRWAYS. This company flies local services in Sierra Leone and a link between Freetown Airport and the capital itself on the other side of the river estuary. Three de Havilland Rapides comprise the fleet and the airline is managed by Nigeria Airways.

Address: 22 Pultney Street, Freetown, Sierra Leone.

SILVER CITY AIRWAYS LTD. A member of the British Aviation Services group, Silver City is now the operating company of most of the services. These include the well-known vehicle ferry services across the Channel, and scheduled passenger services within the U.K. and to Europe. The total B.A.S. fleet, mostly in Silver City colours, comprises four Handley Page Hermes 4s, 14 Bristol 170 Mk. 32s, six Bristol 170 Mk. 21s, 11 Douglas DC-3s and a D.H. Dove.

Address: Silver City House, 62 Brompton Road, London, S.W.3.

SKYWAYS LTD. This British independent company operates scheduled services to Tunis and Malta, and a scheduled animal transport service to France. The associated Skyways Coach Air Ltd. flies coach-air services to Paris, Montpelier and Nice from London. The fleet comprises four Lockheed L-749A Constellations for a freight service to the Far East on behalf of B.O.A.C.; eight Handley Page Hermes, 14 Avro Yorks, and six Douglas DC-3s, with three Avro 748s on order for the coach-air services.

Address: 7 Berkeley Street, London, W.1.

SOCIEDAD AERONAUTICA MEDELLIN S.A. Douglas DC-4s and Curtiss C-46s are flown by this company from Medellin to eight cities in Colombia.

Address: Oficina Del Gerenta, Apartado Aereo 1085, Medellin, Colombia.

SOCIETA ALTA ITALIA TRANSPORTI ELICOTTERI. See Elipadana.

SOCIETA DI NAVIGAZIONE AEREA, S.p.A. See Itavia.

SOCIETA ITALIANA ESERCIZIO ELICOTTERI. See Elivie.

SOCIETADE ACORIANA DE TRANSPORTES AEREOS LTDA. With two de Havilland Doves, this company, formed in 1947, flies local services in the Azores, from Sao Miguel to Santa Maria and Terceira.

Address: Praca da Republica 9 & 13, Ponta Delgada, Sao Miguel.

SOCIETE AERIENNE DE TRANSPORT GUYANE ANTILLES. As SATGA, this company operates with de Havilland Rapides, a Cessna T-50 and a Stinson L-13 Sentinel on seven routes in French Guiana.

Address: 12 Avenue du General de Gaulle, Cayenne, French Guiana.

SOCIETE ANONYME BELGE D'EXPLOITATION DE LA NAVIGATION AERIENNE. See Sabena.

SOCIETE CALEDONIENNE DE TRANSPORTS AERIENS. See Transpac.

SOCIETE TUNISIENNE DE L'AIR. See Tunis Air.

SOUTH AFRICAN AIRWAYS. This Government-owned airline has been operated by the South African Railways Administration since 1934, and now operates an extensive domestic network in the Union, and internationally to Southern Rhodesia, Mozambique, and points in Australia and Europe. The fleet comprises four L-749 Constellations, four Douglas DC-7s, five DC-4s, six DC-3s, seven Viscount 813s and three Boeing 707-344s. The latter are special models with full-span leading edge flaps for operation from high altitude, high temperature airports.

Address: Railway Headquarters, Johannesburg, Transvaal, Union of South Africa.

SOUTH PACIFIC AIR LINES. This operator began in 1960 to fly services from Honolulu to Papeete (Tahiti) via Bora Bora. Lockheed L-1049 Constellations are used, with unspecified flying boats for the Bora Bora–Papeete sector.

Address: 311 California Street, San Francisco 4, California, U.S.A.

SOUTH PACIFIC AIRLINES OF NEW ZEALAND LTD. This company flies Douglas DC-3 Viewmasters on local routes within New Zealand.

Address: Box 1620, Edcans Building, Queen St., Auckland, New Zealand.

SOUTH WEST AIR TRANSPORT. See Suidwes Lugdiens (Edms) Beperk.

SOUTHERN AIRWAYS INC. With a fleet of 23 Douglas DC-3s, Southern is a U.S. local operator, flying since 1949 over a network covering Florida, North Carolina, Tennessee and Louisiana.

Address: 1101 Brown-Marx Building, Birmingham, Alabama.

SOUTHERN SCENIC AIR SERVICES. With de Havilland Rapides, this New Zealand airline flies a 100-mile route from Queenstown to Dunedin with calls at Cromwell and Alexandra.

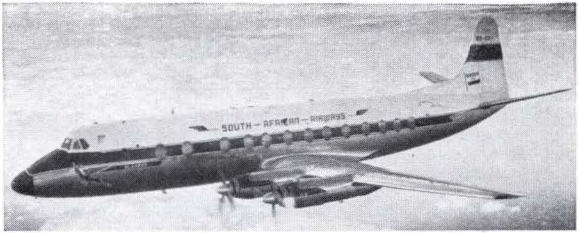
Address: No. 1 R.D., Cromwell, New Zealand.

STARWAYS LTD. A few domestic scheduled services are flown by this British independent operator, with one cross-Channel service to Ostend. The fleet comprises three Douglas DC-4s, principally for charter work, two Viscounts and three DC-3s.

Address: Liverpool Airport, Liverpool 24.

SUDAN AIRWAYS. This Government-owned airline operates a single Viscount 831 between Khartoum and London, in conjunction with British United Airways, and has a fleet of seven Douglas DC-3s and four D.H. Doves for domestic services and routes to Aden, Egypt, Ethiopia, the Lebanon, Saudi Arabia and Uganda. Three Fokker F-27As on order will be the first of this type delivered to an African airline.

Address: P.O.B. 253, Khartoum, Sudan.



One of the seven Viscount 813s operated by South African Airways

SUIDWES LUGDIENS (EDMS) BEPERK. This company is the parent of two small operators, South West Air Transport and Oryx Aviation, flying local services in South West Africa. Its fleet comprises two Piper Apaches and seven Ryan Navions.

Address: J. G. Strijdom Airport, Windhoek, S.W. Africa.

SURINAAMSE LUCHTVAART MAATSCHAPPIJ N.V. Owned by the Government of this Dutch territory but operated commercially, Surinam Airways flies scheduled local services and international charters in the area with an Aero Commander, two Piper Apaches and three Cessna T-50s.

Address: P.O.B. 1029, Paramaribo, Surinam.

SWISSAIR. The Swiss national airline, founded in 1931, is jointly owned by the private citizens and the local councils of the Cantons. Services are flown to all the principal points in Europe, to a number of points in the Near and Middle East, and to New York, Rio de Janeiro, Buenos Aires and Tokyo. The fleet comprises three Douglas DC-8 Srs. 30s, five DC-7Cs, seven DC-6Bs, one DC-6A (freight), and eight Sud Caravelles (leased from S.A.S.); of the seven Convair 990 Coronados to be delivered later in 1961, two will be leased to S.A.S.

Address: P.O.B. 929, Zurich 1, Switzerland.

SYRIAN AIRWAYS. See United Arab Airlines.

T.A.A. See Trans-Australia Airlines.

T.A.B.A. Little is known about this Argentinian local airline—Transportes Aereo Buenos Aires—which flies Beechcraft 18s on four routes out of Buenos Aires. The airline also uses two Douglas DC-3s and two Vikings for charter operations.

Address: Av. Cordoba 949, Buenos Aires, Argentina.

TABSO. The Bulgarian state airline, TABSO was formed in 1949 under joint Bulgarian and Russian control. With five Ilyushin Il-14s and nine Li-2s, it operates services from Sofia to the capitals of other East European States and to points in Russia.

Address: 12 Place Narodno Sobranie, Sofia C., Bulgaria.

TACA. This Argentine carrier—Transporte Aereo Costa Atlantica—began operations in 1960 across the mid-Atlantic route from Santiago and Buenos Aires to Lisbon, Madrid, Rome and Frankfurt via Brasilia and Dakar. The South American routes of Lineas Aerea de Cuyo have also been taken over. Douglas DC-6Bs, Lockheed L.1049s and Fairchild C-82s are used.

Address: Avenida Segurola 2157, Buenos Aires, Argentina.

TACA INTERNATIONAL AIRLINES S.A. Founded in 1939, this Salvador airline flies passenger services with a Viscount 763 and a Viscount 786, with stops at New Orleans, Belize, Guatemala City, San Salvador, Tegucigalpa, Managua, San Jose and Panama, and uses two Douglas DC-4s for freight services in the same area.

Address: P.O.B. 428, Kenner (New Orleans), Louisiana, U.S.A.

TAG AIRLINES INC. Since 1956 (originally as Taxi Air Group) Tag has been flying with four de Havilland Doves and a Heron between Detroit and Cleveland. Because of its short distance this is one of the few journeys on which the traveller arrives before he leaves, Detroit time being one hour behind that in Cleveland.

Address: Detroit City Airport, Detroit 13, Michigan, U.S.A.

T.A.I. A privately owned company, T.A.I. shares with Air France and U.A.T. the French-flag international services. From Paris, it flies as far as the West Coast of the U.S.A. via Australia and the Pacific, and serves many other points in North and West Africa, the Middle and Far East and Australasia. In addition to three Douglas DC-8s it flies two DC-7s, five DC-6s, two DC-4s and a DC-3.

Address: B.P. 118, Orly Airport, Paris, France.

T.A.I.P. (Transportes Aereos da India Portuguesa). The airline of Portuguese India, T.A.I.P. flies local services and also internationally from Goa to Karachi, Beirut, Malta and Lisbon. The fleet comprises two Douglas DC-4s, two Vickers Vikings and a de Havilland Heron.

Address: The Airport, Goa, Portuguese India.

TAN AIRLINES. Privately owned, Transportes Aereos Nacionales S.A. was formed in 1947 as a freight carrier, and now provides scheduled passenger services to British Honduras, Cuba, El Salvador, Guatemala and Miami in the U.S.A. The fleet consists of two Curtiss C-46s.

Address: Edificio Marichal, Tegucigalpa, Honduras.

T.A.P. See Transportes Aereos Portugueses S.A.R.L.

TAROM. The State-owned Rumanian airline, Transporturile Aeriene Romine, operates domestic services and internationally principally to the capitals of other East European countries, to Kiev and Moscow, and to Vienna, Copenhagen, Brussels and Athens. Four Ilyushin Il-18s are due to be delivered, supplementing the fleet of Il-14s, Il-12s and Li-2s.

Address: Baneasa Airport, Bucharest, Rumania.

TASMAN EMPIRE AIRWAYS LTD. Jointly-owned by Australia and New Zealand, TEAL operates New Zealand's international services to Australia, Fiji, Norfolk Island, Samoa, the Cook Islands and Tahiti. The fleet consists of three Lockheed Electras.

Address: P.O.B. 2201, Auckland, New Zealand.

T.A.T. See Transportes Aereos de Timor.

TAXI AEREO DE SANTANDER. Primarily a charter company with a variety of aircraft in its fleet, Taxi Aereo uses four de Havilland Rapides for scheduled services on four routes from Sao Luiz in Brazil.

Address: P.O.B. 384, Sao Luiz, Maranhao, Brazil.

T.C.A. See Trans-Canada Air Lines.

TEAL. See Tasman Empire Airways Ltd.

THAI AIRWAYS CO. LTD. Primarily a domestic operator in Siam, Thai Airways was formed by a merger between Pacific Overseas Airlines (Siam) and Siamese Airways in 1951. It also flies to Penang and Vientiane, using two Douglas DC-4s and seven DC-3s.

Address: 6 Larn Luang Road, Bangkok, Thailand.

THAI AIRWAYS INTERNATIONAL LTD. International services from Thailand have been flown since 1959 by THAI International, with S.A.S. providing technical and administrative assistance by agreement with Thai Airways. Services are flown to Burma, Cambodia, Formosa, Hong Kong, India, Japan, Malaya and Singapore, with three ex-S.A.S. Douglas DC-6Bs.

Address: 1101 New Road, Bangkok, Thailand.

TRADAIR LTD. The only scheduled operations by this British independent company are freight services to points in Europe. It also flies inclusive tours and undertakes charters from its base at Southend Airport. The fleet includes two Viscount 707s, six Vickers Vikings and two Viking freighters.

Address: Prince Rupert House, 64 Queen Street, London, E.C.4.

TRANSA CHILE. This company operates an all-freight service with Curtiss C-46s from its home base in Santiago de Chile to Peru, Ecuador, Panama and Venezuela and passenger services within Chile and to Argentina. Two Consolidated Catalina amphibians are used for a service from Santiago to Juan Fernandez.

Address: Office 21–23, Agustinus 1161, Santiago de Chile.

TRANSAIR LTD. Local services are flown by this company from Winnipeg, with a Douglas DC-4, a DC-3, a Lockheed 12A, an Avro York and four Cansos.

Address: No. 5 Hangar, Winnipeg Airport (P.O.B. No. 5), St. James, Manitoba, Canada.

TRANS ARABIA AIRWAYS. Originally a non-scheduled freight operator, Trans Arabia now flies between Kuwait and the Lebanon via Damascus on a regular basis, using two Douglas DC-6s and two DC-4s.

Address: Al-Safat Square, Kuwait, Persian Gulf.

TRANS ATLANTICA ARGENTINA. With Lockheed L-1049H Super Constellations, this company began operation late in 1960 on a route from Buenos Aires to Geneva, serving Rio de Janeiro, Recife and Lisbon also.

Address: 1171 Lavalle, Buenos Aires, Argentina.

TRANS-AUSTRALIA AIRLINES. Government-sponsored, T.A.A. flies in competition with a number of privately-owned airlines in Australia, on domestic routes and to Papua and New Guinea. The fleet comprises three Lockheed Electras (one leased from Qantas), 12 Vickers Viscounts 816/756/720, eight

Trans-Canada Air Lines' fleet includes Viscount 724s (foreground), Vanguard 952s (centre) and DC-8 Series 50s

Trans World Airlines has sixteen Lockheed L.1649A Starliners

Fokker F-27s, two Douglas DC-6Bs (leased from Ansett-ANA), three DC-4s, 16 DC-3s and Bell 47s for services around Melbourne. T.A.A. is also responsible for the maintenance of the six Drover 3s of the Royal Flying Doctor Service and has two Hiller UH-12s for charter flying.

Address: 339 Swanston Street, Melbourne, C.1, Victoria, Australia.

TRANS-CANADA AIR LINES. Canada's flag carrier, state-owned T.C.A. is responsible for a large network of domestic routes, including many which are commercially unattractive but socially necessary. International routes serve 21 points in the U.S.A., the U.K., Europe and the Caribbean. The first of eleven DC-8 Srs. 50s went into service between Montreal and Vancouver in June 1960, and now fly on the international routes; other equipment comprises 49 Viscount 720s and 756s, 12 L-1049 Super Constellations, six Douglas DC-3s, 17 Canadair North Stars and, in course of delivery, 23 Vickers Vanguard 952s.

Address: International Aviation Building, 1080 University Street, Montreal, P.Q., Canada.

TRANS CARIBBEAN AIRWAYS INC. This U.S. carrier operates services out of New York to points in San Juan (Puerto Rico) and Aruba in the Netherlands Antilles. The fleet comprises two Douglas DC-6s, two DC-4s, seven DC-3s and a Curtiss C-46.

Address: 200 West 57th Street, New York 19, N.Y., U.S.A.

TRANSCONTINENTAL S.A. This company was formed in 1956 jointly by Argentine and U.S. businessmen. It now operates domestically in the Argentine and internationally to Sao Paulo, Rio de Janeiro, Caracas and New York; and to Paraguay and Uruguay. The fleet includes two Bristol Britannia 308s, two Lockheed L-1049B Super Constellations and seven Curtiss C-46s.

Address: Cerrito 1117, Buenos Aires, Argentina.

TRANS GABON. Using DC-3s and Dragon Rapides, this company flies services in the Gabon.

Address: Boite Postale 90, Libreville, Gabon, West Africa.

TRANS MAR DE CORTES. This is a Mexican local operator, flying with a Fairchild F-27 and three DC-3s, and in process of expanding with a service to the U.S. West Coast.

Address: Calle Esquerro 30, Apartado Postal 149, La Paz, Baia California.

TRANS-MEDITERRANEAN AIRWAYS. After several years of non-scheduled and mostly freight operations, Trans-Mediterranean has recently started scheduled passenger services with three Douglas DC-4s to Baghdad, Teheran, Bahrain, Doha, Brindisi, Basle and Frankfurt. Seven Avro Yorks are used for freighting.

Address: El-Murr Building, Humra Street, (P.O.B. 3018), Beirut, Lebanon.

TRANSPAC (SOCIETE CALEDONIENNE DE TRANSPORTS AERIENS). With a fleet of three de Havilland Rapides and two Herons, Transpac flies services between Noumea , the Loyalty Islands and Ile des Pines.

Address: 6 rue de Verdon, Noumea, New Caledonia.

TRANSPORTES AEREO BUENOS AIRES. See T.A.B.A.

TRANSPORTES AEREO COSTA ATLANTICA. See TACA.

TRANSPORTES AEREOS DE GUINE PORTUGUESA. With a D.H. Heron 2E and two Rapides, this company operates local services in Portuguese Guinea and to Dakar in the Mali Federation, where they connect with long-haul services by other operators.

Address: Craveiro Lopes Airport, P.O.B. 77, Bissau, Portuguese Guinea.

TRANSPORTES AEREOS DA INDIA PORTUGUESA. See T.A.I.P.

TRANSPORTES AEREOS DE TIMOR. Using two de Havilland Doves, T.A.T. flies local services in Portuguese Timor, and a service to Baucau to link with the T.A.A. DC-3 service to Darwin, Australia.

Address: Dili, Timor Province.

TRANSPORTES AEREOS NACIONALES S.A. See TAN Airlines.

TRANSPORTES AEREOS PERUANAS S.A. A number of local services are flown by this airline from Lima to other cities in Peru, using Curtiss C-46s.

Address: Paleo Colon 266, Lima.

TRANSPORTES AEREOS PORTUGUESES S.A.R.L. The State-owned Portuguese airline flies with three Lockheed L-1049 Super Constellations and Douglas DC-6Bs to Mozambique, Tangier, Casablanca and Paris, and local services in Portugal. The route to London is flown in pool with B.E.A. using the latter's Viscounts and Comets.

Address: 79 Rua Conde Redondo (Apartado 2562), Lisbon, Portugal.

TRANSPORTES AEREOS SALVADOR. Local services are flown by this recently-formed airline from Salvador, Brazil, using Douglas DC-3s.

Address: 8 Avenida Ioana Angelica, Salvador, Bahia, Brazil.

TRANSPORTURILE AERIENE ROMINE. See Tarom.

TRANS-TEXAS AIRWAYS. A U.S. local service airline with a fleet of 25 Douglas DC-3s and 22 Convair 240s, this airline (originally known as Aviation Enterprise Ltd.) has been flying scheduled services since late 1947 to serve points in Texas, Louisiana, Mississippi, Arkansas and Tennessee.

Address: Municipal Airport, Houston 17, Texas.

TRANS WORLD AIRLINES INC. T.W.A. shares with Pan American the primary responsibility for U.S. flag international services around the World, and also has a large domestic network of local and transcontinental routes within the U.S.A. The name was originally Transcontinental and Western Air, formed by a four-airline merger in 1930. At present about 90% of T.W.A. stock is owned by Howard Hughes through the Hughes Tool Co. A merger with Northeast Airlines is being considered. The fleet comprises 15 Boeing 707-131s and 12 707-331s, 28 Lockheed L-1649A Starliners (12 as freighters); 26 L-1049G and seven L-1049A Super Constellations; eight L-1049H freighter convertibles; 69 L-049 and 749A Constellations; 27 Martin 404s, a DC-4 freighter and a Fairchild C-82 flying workroom. Twenty Convair 880s were in process of delivery at the beginning of 1961, and orders have been placed for four Boeing 720Bs, 24 Boeing 707-131Bs and six 707-331Bs.

Address: 380 Madison Avenue, New York 17, N.Y., U.S.A.

TUNIS AIR. This company, Societe Tunisienne de l'Air, is jointly owned by the Tunisian Government and Air France, the latter company giving technical assistance. Three DC-3s and two DC-4s are used for domestic services and on routes to Algeria, Corsica, France, Italy and Libya. A Caravelle III will be made available to Tunis Air by Air France in 1961.

Address: 47 rue de Portugal, Tunis, Tunisia.

TURK HAVA YOLLARI. The Turkish airline T.H.Y. was formed in 1956 as a joint State and privately-owned company. Much of its work is concerned with domestic operations, but services are also flown to Nicosia, Beirut, Athens and Rome. The fleet comprises four Vickers Viscount 794s, ten Fokker/Fairchild F-27s, 21 Douglas DC-3s and seven de Havilland Herons.

Address: Nesli Han, Galata, Istanbul, Turkey.

T.W.A. See Trans World Airlines.

U.A.T. See Union Aeromaritime de Transport.

UKAMPS. The airline of North Korea, UKAMPS is a department of the Ministry of Communications. From Pyong-yan, a service is flown to Peking using Li-2s.

Address: Prospekt Stalina, Pyong-yan, Korean Democratic Republic.

UNION AEROMARITIME DE TRANSPORT. This independent French airline flies scheduled services in collaboration with Air France and T.A.I., principally between France and Africa, and within Africa. It also participates, with Air France, in the Air Afrique operations. The fleet comprises two Douglas DC-8 Srs. 30s, ten DC-6s, four DC-4s and seven D.H. Herons.

Address: 5 Boulevard Malesherbes, Paris 8e, France.

UNION OF BURMA AIRWAYS BOARD. The national airline of Burma, U.B.A. serves points within Burma and flies to Thailand, India and East Pakistan, using two Viscount 761s and eight Douglas DC-3s.

Address: Strand Road, Rangoon, Burma.

UNITED AIRLINES INC. A major U.S. trunk carrier, United has its roots in Varney Air Lines in 1926, the present name being adopted in 1931 following a four-airline merger. The company was a pioneer of modern-style aircraft when it introduced the Boeing 247D on a 20-hour transcontinental schedule in 1933. Now, 82 cities are served in 24 American states stretching across the continent and along the west coast, across the Pacific to Hawaii and into Canada. United was co-pioneer, with Delta, of Douglas DC-8 service in September

United Arab Airlines operates five de Havilland Comet 4Cs to the principal cities in the Middle East and to points in Europe

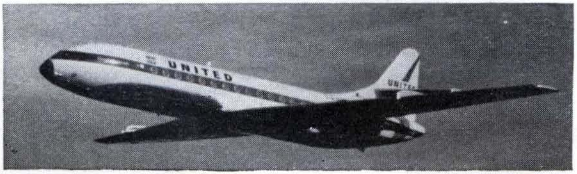
1959, and the first to order and fly the Boeing 720, in mid-1960. It was also the first, with Eastern, to order Boeing 727s for service in 1964. In addition to 40 of the latter and 20 Sud-Aviation Caravelle VIRs on order, the fleet comprises 21 Douglas DC-8 Srs. 10s, 15 DC-8 Srs. 20s and three DC-8 Srs. 50s; 29 Boeing 720s, 39 Douglas DC-7s, 40 DC-6Bs, 42 DC-6s, 6 DC-7As, 7 DC-6As, and 27 Convair 340s. On July 1, 1961, Capital Airlines merged with United which then became the world's largest airline.

Address: 5959 S. Cicero Avenue, Chicago 38, Illinois, U.S.A.

UNITED ARAB AIRLINES S.A.A. Following the formation of the United Arab Republic by Egypt and Syria, the two national airlines of these countries—Misrair and Syrian Airways—were merged in 1960 and took this new title. The fleet comprises five D.H. Comet 4Cs, seven Viscount 739s and four Douglas DC-3s and the route network, based on Cairo, Alexandria and Damascus, extends to the principal cities of the Middle East and to selected points in North Africa and Europe.

Address: Almaza Airport, Heliopolis.

The first of twenty United Airlines Caravelle VIRs



UNITED STATES OVERSEAS AIRLINES INC. This U.S. airline operates primarily on a non-scheduled basis, but flies a low-frequency passenger service between Miami, New York, Chicago, Los Angeles and San Francisco, and across the Pacific to Honolulu and Okinawa.

Address: Cape May County Airport, P.O.B. 234, Wildwood, N.J., U.S.A.

VARIG. Founded in 1927, Varig, or S.A. Empresa de Viacao Aerea Rio Grandense to give it its full title, is Brazil's oldest airline, and 85% of the shares are now held by employees. It operates a considerable local network in Brazil and also to New York, Montevideo, Buenos Aires, Port of Spain and Ciudad Trujillo. The fleet comprises two Boeing 707-441s, two Sud-Aviation Caravelle Is, five Lockheed L-1049G Super Constellations, 21 Douglas DC-3s, 12 Convair 240s and 14 Curtiss C-46s.

Address: Avenida Borges de Medeiros (P.O.B. 243), Porto Alegre, Brazil.

VASP. Locally-owned in Brazil, this airline—Viacao Aerea Sao Paulo S.A.—operates a number of services within the country. It shares with Cruzeiro and Varig responsibility for the Ponta Aerea (Air Bridge) service between Rio de Janeiro and Sao Paulo (a distance of 227 miles) at a 30-minute interval through-

out the day. The fleet includes five Vickers Viscount 827s, 15 Douglas DC-3s, 16 Saab Scandias and a Beech 18.
Address: Rua Libero Badaro 89, Sao Paulo, Brazil.

VIACAO AEREA SAO PAULO S.A. See VASP.

VIACAS AEREA GAUCHA. See SAVAG.

VIASA. This is the operating name of a Government-sponsored airline set up in Venezuela in 1961 to operate the international services previously flown by L.A.V. and Avensa. Its initial equipment is drawn from those operators, and comprises two DC-6Bs and six Lockheed L-1049s, with a Douglas DC-8 chartered from K.L.M. (including crew) for the most important transatlantic services, and a Convair 880-M. A second Convair 880-M is scheduled to be delivered in September 1961.
Address: Centro Comercial C.A., Apartado 6857, Caracas, Venezuela.

VENEZOLANA INTERNACIONAL DE AVIACION S.A. See Viasa.

WAAC (NIGERIA) LTD. See Nigeria Airways.

WEST COAST AIRLINES INC. This U.S. local service airline was the first to put the Fokker-designed F-27, built by Fairchild, into service. Its network covers the States of Washington, Oregon and Idaho, with service also to points in Utah, California, Montana and across the border to Calgary in Canada. In addition to six Fairchild F-27s, West Coast has 14 Douglas DC-3s.
Address: Georgetown Station, Seattle 8, Washington, U.S.A.

WEST COAST AIRWAYS LTD. This local New Zealand airline flies with two de Havilland Rapides between Hokitika, Haast and Milford Sound.
Address: Seaview Airport (P.O.B. 106), Hokitika, Westland, N.Z.

WESTERN AIR LINES INC. A regional trunk operator, Western is in fact the oldest surviving American airline, having flown its first scheduled service in 1926. It now operates a network covering 13 of the western U.S. states, and also into Canada and Mexico. The fleet comprises 12 Lockheed Electras, two Boeing 707s (built for Cubana and leased from Boeing); 27 Douglas DC-6s, two DC-3s, five Convair 240s and four Boeing 720-047Bs for 1961 delivery.
Address: 6060 Avion Drive, Los Angeles 45, California, U.S.A.

An Aero Commander used on local routes by Yemen Airlines

WESTERN ALASKA AIRLINES. With a mixed fleet comprising Beechcraft Bonanza, Cessna 180, Grumman Goose and Lockheed 12A, this company operates local services in Alaska from Dillingham and King Salmon.
Address: Dillingham, Alaska.

WIDEROE'S FLYVESELSKAP OG POLARFLY A.S. Primarily a charter, ambulance and general operator, Wideroe's flies scheduled services locally from Narvik and Tromso using de Havilland Otters and Norsemen.
Address: Wergelandsveien 7, Oslo, Norway.

WIEN ALASKA AIRLINES INC. This Alaskan operator has a history going back to 1924 in the name of Northern Air Transport. Scheduled services are flown over a variety of routes in Alaska. Primary aircraft in the fleet are two Fairchild F-27s, a Douglas DC-3 and four Curtiss C-46s, supported by 10 assorted Cessna single-engined types, a Beech 18, a D.H.C. Beaver and five Norsemen.
Address: P.O.B. 690, Fairbanks, Alaska.

WOODS AIRWAYS PTY LTD. With two Avro Ansons, this airline flies only on the 22-mile route from Perth to Rottnest Island.
Address: National House, 49 William Street, Perth, W. Australia.

YEMEN AIRLINES. This small local operator uses two Douglas DC-3s for a weekly service from Taiz to Djibouti, and three Aero Commanders and a Beech 18 on routes serving Hodeida, Sana'a, Gizan and Jeddah.
Address: Taiz, Yemen, Arabia.

INTERNATIONAL CIVIL AIRCRAFT MARKINGS

AN	Nicaragua
AP	Pakistan
B	Formosa
CB,CP	Bolivia
CC	Chile
CCCP	Soviet Union
CF	Canada
CN	Morocco
CR-A	Mozambique
CR-G	Portuguese Guinea
CR-I	Portuguese India
CR-L	Angola
CS	Portugal
CU	Cuba
CX	Uruguay
D	West Germany
DM	East Germany
EC	Spain
EI,EJ	Eire
EL	Liberia
EP	Iran
ET	Ethiopia
F	France
F-KH	Cambodia
F-LA	Laos
F-O	French Colonies
F-OG	Guadeloupe
G	United Kingdom
HA	Hungary
HB	Switzerland
HC	Ecuador
HH	Haiti
HI	Dominica
HK	Colombia
HL	South Korea
HP	Panama
HS	Thailand
HZ	Saudi Arabia
I	Italy
JA	Japan
JY	Jordan
JZ	Dutch New Guinea
LN	Norway
LQ,LV	Argentina
LX	Luxembourg
LZ	Bulgaria
N	U.S.A.
OB	Peru
OD	Lebanon
OE	Austria
OH	Finland
OK	Czechoslovakia
OO	Belgium
OY	Denmark
PH	Netherlands
PI-C	Philippines
PJ	Dutch W. Indies
PK	Indonesia
PP,PT	Brazil
PZ	Surinam
SE	Sweden
SL	Saar
SN	Sudan
SP	Poland
SU	United Arab Republic (Egypt)
SX	Greece
TC	Turkey
TF	Iceland
TG	Guatemala
TI	Costa Rica
TS	Tunisia
VH	Australia
VP-B	Bahamas
VP-F	Falkland Islands
VP-G	British Guiana
VP-H	British Honduras
VP-J	Jamaica
VP-K	Kenya
VP-L	Leeward Islands
VP-M	Malta
VP-P	West Pacific Isles
VP-S	Somaliland
VP-T	Trinidad, Tobago
VP-U	Uganda
VP-V	Saint Vincent
VP-X	Gambia
VP-Y	Central African Federation
VP-Z	Zanzibar
VQ-B	Barbados Islands
VQ-C	Cyprus
VQ-F	Fiji Islands
VQ-G	Grenada
VQ-H	Saint Helena
VQ-L	Saint Lucia
VQ-M	Mauritius
VQ-S	Seychelle Islands
VQ-Z	Basutoland, Bechuanaland and Swaziland
VR-A	Aden
VR-B	Bermuda
VR-H	Hong Kong
VR-L	Sierra Leone
VR-N	British Cameroons
VR-O	Borneo
VR-R	Malaya
VR-S	Singapore
VR-T	Tanganyika
VR-U	Brunei
VR-W	Sarawak
VT	India
XA,XB,XC	Mexico
XH	Honduras
XT	China
XV	Viet Nam
XY	Burma
YA	Afghanistan
YE	Yemen
YI	Iraq
YJ	New Hebrides
YK	United Arab Republic (Syria)
YR	Rumania
YS	El Salvador
YU	Yugoslavia
YV	Venezuela
ZA	Albania
ZK,ZL,ZM	New Zealand
ZP	Paraguay
ZS,ZT,ZU	South Africa
3A	Monaco
3X	Guinea
4R	Ceylon
4X	Israel
5A	Libya
5N	Nigeria
9G	Ghana
9K	Kuwait
9M	Malaya
9N	Nepal
9O, 9P, 9Q, 9R, 9S, 9T	Congo
9U	Ruanda-Urundi

GLOSSARY OF AERONAUTICAL TERMS

A

A.D.F. Initials of "automatic direction finder" radio equipment which allows a ground station to establish the bearing of a particular aircraft.

Aerodyne. Any heavier-than-air type of aircraft (see also aerostat).

Aerofoil. A shaped surface which produces lift when moved through the air; a chordwise section through a wing or rotor blade.

Aerostat. Aircraft which, by virtue of a lifting gas such as hydrogen or helium, are "lighter than air"—balloons, airships, blimps, dirigibles (see also aerodyne).

A.I. The airborne interception type of radar, used in fighters and interceptors.

Aileron. Primary control surfaces at each wing tip which operate differentially (i.e. one goes up when the other goes down) to give lateral (rolling) control.

Air brake. A retractable surface on an aircraft which can be extended to increase drag and thereby decrease speed during combat, descent or landing.

Airscrew. Archaic term for propeller; use discouraged because of confusion with aircrew, the flying crew of an aeroplane.

Airship. An aerostat comprising a gas filled balloon with a means of propulsion. Can be either non-rigid (with no keel) or semi-rigid (with a keel).

All-flying tail. See flying tail.

All-up weight. The fully loaded weight; maximum permitted weight for take-off.

Altimeter. Aircraft instrument to indicate height of aircraft by detecting change of atmospheric pressure.

Amphibian. Type of aircraft able to operate from land and water.

Angled deck. The rear flight deck of an aircraft-carrier which is set at an angle to the centre line of the ship, so that there is no danger of aircraft landing on it striking other aircraft waiting to be catapulted from the forward portion of the flight deck.

Anhedral. Negative dihedral, in which the angle between the centre line of the wing and a horizontal datum is negative.

Antenna. An aerial of any kind used to transmit or receive radio or radar impulses.

Anti-g suit. Worn by pilots to counteract the effects of high "g" loads by applying pressure to the lower abdomen and legs and preventing blood draining from the brain.

Anti-shock body. A fairing on a wing or fuselage designed to reduce the onset of shock waves and so increase the maximum controllable speed of the aircraft.

Anti-spin parachute. A parachute carried, usually on test and experimental aircraft, to assist recovery from a spin.

Area rule. A method of reducing drag by "waisting" the fuselage. The reduction in cross section area at the waist is made to equal the cross section area of the wings.

Arrester hook. A hook beneath the rear fuselage of Naval aircraft, extended to engage with arrester wires across an aircraft carrier deck or a runway.

A.S.I. The airspeed indicator, indicating speed through the surrounding air mass by a comparison of static and ram pressures.

Aspect ratio. The ratio of wing span to chord, obtained by dividing the square of the span by the gross area.

A.S.V. Air-to-surface vessel radar, used by maritime reconnaissance and naval strike aircraft.

A.T.O. Initials for "assisted take-off", an alternative form for J.A.T.O. or R.A.T.O.G.

Autopilot. A mechanical or electric-mechanical device which will maintain an aircraft on a predetermined heading and altitude, controlling ailerons, elevators and rudder through a system of gyros.

B

Balance tab. An auxiliary section of a control surface (aileron, elevator or rudder), arranged to move in the opposite sense to the control surface to reduce the control forces involved.

Balloon. An aerostat comprising a non-rigid gas container, with no means of propulsion.

Bank. The tilting of an aircraft to left or right to initiate a change of direction.

b.h.p. Brake horse power, the power developed by a piston engine when measured against a brake.

Bicycle undercarriage. One in which the main landing wheels are one behind the other in line under the fuselage, usually with wing-tip outrigger wheels.

B.L.C. Boundary layer control. Various methods are used to maintain a smooth flow in the " boundary layer " of air around the wing, fuselage and tail, or to remove turbulence in it; these include " blowing " air over the surfaces to be controlled or " sucking " through perforations in the surfaces to keep the boundary layer in place.

Black-out. Loss of vision and, in extreme cases, loss of consciousness by aircrew resulting from high " g " loads.

Blimp. A small semi-rigid airship.

Bogie. Type of undercarriage with four or more wheels to each leg.

Boundary layer. The thin layer of air immediately adjacent to a surface in motion through the air. Because of skin friction, the air is slowed down in the boundary layer, and if it is allowed to become turbulent high drag and poor performance result. (See also laminar flow.)

Braking propeller. A propeller the blades of which can be reversed in pitch so that they have a braking effect on the landing run.

Buddy refuelling. A type of flight refuelling for tactical use by small aircraft, in which long-range tanks and a drogue pack are carried by one aircraft to refuel others of similar type.

Buffet. A parachute used during the landing of an aircraft to reduce the landing run.

C

Camber. The curvature of the centreline of an aerofoil section, which increases the lift of the section.

Canard. An aeroplane of " back-to-front " layout, with a horizontal tailplane (noseplane) ahead of the wing.

Canopy. The transparent fairing over a cockpit.

Cantilever. A structure supported only at one end; i.e. a wing without bracing struts, or a single-leg undercarriage.

C.G. Centre of gravity.

C.L. Co-efficient of lift. A measure of the efficiency of a wing in producing lift.

C. of A. Certificate of airworthiness, issued by the competent national authority (e.g. the British Air Registration Board or the U.S. Federal Aviation Agency) to signify that an aeroplane conforms to appropriate airworthiness requirements.

Channel wing. A wing form of channel or " U " shape containing a propeller and developing high lift as a result of the induced airflow over it.

Chord. The distance from the leading edge to trailing edge of an aerofoil, measured in parallel with the fuselage centre line.

Co-axial propellers. Two independent propellers mounted on a common shaft and rotating in opposite directions.

Compressibility. The effects of flight at near-sonic and supersonic speed on the air around and ahead of the aircraft.

Contrail. Short for condensation trail, which occurs when water vapour in the exhaust gases from aero-engines condenses in low temperatures at high altitude.

Contra-prop. Alternative style for contra-rotating propeller; two propellers on a single shaft geared to rotate in opposite directions.

Crescent wing. A swept-back wing of special type, in which the degree of sweep back is reduced from root to tip.

Critical mach number. The speed of an aeroplane, expressed as a proportion of the speed of sound, at which part of the airflow around it becomes supersonic.

D

Decca. A navigation aid, in which transmission from a master and three slave ground stations form a " grid " and dials or a " Flight Log " pictorial display in the aircraft indicate the position of the aircraft in relation to this grid.

Dectra. A variation of Decca for long ranges, including the North Atlantic.

Delta. A wing or tailplane of triangular or near-triangular plan form, so called from the Greek letter Δ (delta).

Dihedral. A measure of the angle between the centre line of the wing when viewed head-on and a horizontal datum. If the angle so made is negative, the wing has anhedral.

D.M.E. Distance measuring equipment, a navigation aid which measures and indicates to the pilot the aircraft's distance from a ground transmitter.

Dive brake. An earlier term for air brake.

Dog tooth. Describes a wing in which the outer section has an extended leading edge and greater chord, helping to reduce tip stalling. Also known as " saw-tooth ".

Doppler. The name of an Austrian physicist who propounded the principles of wave propagation, upon which certain navigation and guidance systems are now based. A Doppler navigator in an aircraft measures the characteristics of radar waves bounced back to it from the earth below to obtain information on aircraft speed, from which positional information can be derived.

Dorsal fin. A small extension of the fin along the centre line of the fuselage.

Drag. The resistance of the air to an aircraft's forward motion.

Drogue. A tubular fabric target, used for air-to-air gunnery practice; also, the funnel-shaped portion of in-flight refuelling gear trailed by a tanker aircraft.

Drone. A pilotless aircraft, radio controlled from the ground or from another aircraft, for use as a target.

Droop snoot. A wing leading edge with a drooped section to improve lift at low speeds.

Dutch roll. Used to describe the effects of yaw in a swept wing aircraft. In a yaw, more lift is developed by the leading wing, which rises, causing the aircraft to side-slip, whereupon the opposite wing develops more lift and the side-slip is reversed. If uncontrolled, the motion builds up, eventually causing the aircraft to invert or spin.

E

E.C.M. The initials of " electronic counter measures ", used to describe the equipment used, or the aircraft rôle involving radio and radar means of jamming enemy transmissions, deflecting weapon guidance beams, etc.

e.h.p. Equivalent horse power—the horse power developed by a turboprop engine at the propeller shaft plus the residual jet thrust converted to a horse-power equivalent.

Ejection seat. A crew seat which can be fired from the aircraft, complete with occupant, in an emergency; parachutes deploy automatically and the seat separates from the occupant.

Elevator. The moving portion of the horizontal tailplane which provides longitudinal (dive and climb) control.

Elevon. Control surfaces on a delta-wing or an all-wing aircraft which operate differentially as ailerons and in unison as elevators.

e.s.h.p. Equivalent shaft horse power—an alternative form for e.h.p. (q.v.).

F

Fatigue. Under repeated loads, such as experienced in flight, metal parts get " tired " and lose strength. Fatigue failures may follow if the aircraft structure has not been properly designed.

Feather. The action of turning propeller blades to neutral pitch.

Fin. The fixed portion of the vertical tail surface.

Fineness ratio. The ratio of length to width of a shape such as an aircraft fuselage or aerofoil.

Flap. A surface on the trailing edge of the wing which can be lowered to increase the lift and/or drag for take-off and landing. Various types include plain, split, Fowler, Youngman, Gouge, slotted. Leading edge flaps are similar in operation and are used to improve lift and control at low speeds.

Flight refuelling. The system of transferring fuel from one aircraft to another while in flight. Two basic methods in use are the British probe and drogue and U.S. flying boom.

Flush aerial. A radio or radar aerial mounted within the structure of an aircraft and covered by di-electric panels merging with the skin.

Flying tail. A tailplane which is used as a control surface by variation of its incidence (angle of attack).

Foreplane. The forward control surface on a canard layout; alternative term for noseplane.

Fowler flap. A type of wing trailing edge flap which moves back on guide rails to increase the area and therefore the lift of the wing.

G

" g ". A conventional measure of acceleration. One " g " is equal to an acceleration of 32 ft./sec./sec., which is the rate of acceleration of a body in free fall due to gravity. Loadings of several " g " cause discomfort to human beings and strain to aircraft; beyond certain limits, the human " blacks out " and then loses consciousness, and the airframe breaks.

g- suit. Same as anti-g suit (q.v.).

Gap. A measure of the distance between upper and lower wings of a bi-plane.

G.C.A. Ground controlled approach, a radar landing aid in which a ground controller radios directions to an approaching aircraft which he watches on a radar screen.

G.E.E. A navigation aid, generally similar to Decca (q.v.) in which an aircraft's position is shown on a cathode ray tube.

G.G.S. Initials of " gyro gun sight ".

Gull wing. A wing arrangement in which the inner sections have extreme dihedral and the outer panels little or no dihedral.

H

Heat barrier. Alternatively the " thermal barrier ". Used loosely to indicate the problem of aerodynamic heating, which causes the surface of an aircraft at high speed to rise in temperature. This can cause discomfort to the occupants and, more important, a loss of strength in the structure leading to failure. Conventional aluminium alloy structures cannot be used for sustained flight at much above Mach 2·4; above this speed, stainless steel must be used.

H.F. High frequency, referring to radio equipment operating in the frequency range from 3 to 30 Mc/s.

Horn balance. An alternative to a balance tab on a control surface, to reduce operating loads, consisting of a projection forward of the hinge line.

I

I.A.S. Indicated air speed—the reading on the air-speed indicator. Because of reducing static pressure as altitude increases, the I.A.S. becomes a progressively smaller proportion of *true* air speed through the air as the aircraft climbs.

I.F.F. Identification Friend or Foe—a radar device which serves to identify the aircraft in which it is mounted by producing a characteristic echo on the ground radar screen.

I.F.R. Instrument flight rules, by which an aircraft is flown when visibility and ceiling are below certain minima.

I.L.S. Instrument landing system. A radio equipment transmitting signals from the end of a runway to allow an aircraft to fly down a " glide path " without seeing the ground below.

I.M.C. Instrument meteorological condition, used to describe the conditions in which I.F.R. applies.

Integral tank. A fuel tank formed by the basic structure, usually of a wing, by making a fuel-tight seal of spars, ribs and skin.

J

J.A.T.O. Jet assisted take-off—a slightly inaccurate term for the rocket packs used to shorten the take-off run of heavily loaded aircraft.

Jet flap. A system of ejecting most or all of the exhaust from a jet engine through a slit in the wing trailing edge, so that the air flow produces the effect of a lift-increasing flap.

J.P.4. Designation of a " wide-cut " gasoline aviation fuel for jet engines, with characteristics similar to petrol.

K

Kerosene. An aviation fuel, similar to paraffin, widely used in jet engines. U.S. spelling is kerosine and military designation J.P.1.

Knot. A measurement of speed, equal to 1·115 m.p.h., or one nautical mile per hour. Increasingly in use to indicate aircraft speeds.

L

L.A.B.S. The initials of " low-approach bombing system ", in which an aircraft approaches its target at low level, then pulls up into a half-loop, releasing the bomb upward and rolling out to fly away from the target before the bomb explodes.

Laminar flow. Air flow in the boundary layer (q.v.) around a surface is laminar if it is not turbulent. As turbulence increases drag and reduces efficiency, laminar flow is the object of all good aerodynamic design.

Leading edge. The front edge of a wing or aerofoil surface.

Lift. The force in an upward direction which sustains an aircraft in flight. Lift must exceed weight, acting downwards, to achieve flight, while thrust forward must exceed drag to produce forward motion.

Limiting Mach number. The speed, expressed as a proportion of the speed of sound, beyond which an aeroplane cannot be controlled because of the break-away of airflow.

Link trainer. A simple form of flight simulator, developed by the Link company in America, to give pilots basic training in instrument flying and radio procedures.

M

Mach number. A measurement of speed related to the speed of sound. A Mach number of 1 is the speed of sound, which varies from 760 m.p.h. at sea level to a constant 660·6 m.p.h. above 36,600 ft. Thus the term Mach = 0·5 means half the speed of sound, Mach = 3·0 is three times the speed of sound and so on.

Mass balance. A weight, carried internally or externally on a control surface to prevent an unstable oscillation of the surface known as flutter which might otherwise build up.

Mean chord. The average chord of a wing, obtained by dividing gross wing area by span.

M.F. Medium frequency, referring to radio equipment operating in the frequency range from 300 to 3,000 kc/s.

Mirror sight. An aid for deck landings on aircraft carriers in which a pilot must keep a spot of light, projected onto and reflected by a concave mirror, aligned with fixed lights on each side of the mirror.

Mock-up. A full-size replica, in wood or metal, of all or part of a projected aircraft, used to demonstrate its features, establish cabin and cockpit layouts, check equipment location, etc.

Monocoque. A common form of aircraft construction in which the outer skin, supported by light frames and stringers, is a primary load-carrying structure.

N

Nacelle. An enclosed structure containing the engine—or sometimes the crew—distinct from the fuselage.

Nautical mile. A measurement of distance, equal to one minute of latitude (6,080 ft.). One nautical mile equals 1·115 statute miles.

Nose flap. A leading-edge flap on a wing.

Noseplane. The forward lifting and control surface on a canard layout, taking the place of the tailplane.

O

Octane. A measure of the anti-knock properties of fuel measured against Iso-octane. 100 octane means properties 100% as good as Iso-octane, and so on.

Oleo. An undercarriage leg in which shock is absorbed by a piston moving up a cylinder containing hydraulic fluid or compressed air.

Overshoot. A misjudged landing approach in which the aircraft touches down too far down the runway to pull up safely. Also used to describe the procedure of "going round again" to avoid touching down too far along the runway.

P

Parasol. Describes a monoplane in which the wing is carried on struts above the main fuselage structure.

Payload. That part of an aircraft's total weight which can be used to carry passengers or freight (i.e. for which revenue can be obtained).

Pitch-up. A characteristic of swept-wing aircraft at speeds close to the stall, when lift is lost at the wing tips; the consequence of tip-stalling.

Pitot tube. The instrument used to detect total ram pressure of the airflow round an aircraft, to compare with static pressure and obtain an air speed reading from the resultant comparison

Pod. A type of engine nacelle, separate from the main structure of the aircraft to which it is attached by a pylon.

Power control. A flying control, the movement of which is assisted or totally effected by a hydraulic, pneumatic or electric actuator, used in high speed aircraft in which the force of the airflow over control surfaces makes it impossible for the pilot to use conventional manual controls.

Pressure differential. The difference, measured in lb./sq. in., between pressure inside an aircraft cabin and atmospheric pressure outside.

Pressure suit. Used by military aircrew at very high altitudes, where low atmospheric pressure makes normal breathing difficult or impossible.

Pressurisation. The process of making an aircraft cockpit or cabin airtight and maintaining a pressure inside it higher than that of the outside air pressure, which decreases linearly with increase of altitude to the point where survival would be impossible.

Probe. The receiving part of flight refuelling equipment, which is inserted into the tanker's drogue to make a fuel-tight connection between the two aircraft.

Pylon. A streamlined fairing on a wing or fuselage to carry a fuel tank, weapon or engine pod.

R

Radome. Any dome-shaped or curved fairing over radar aerials on an aircraft.

R.A.T.O.G. Initials of "rocket assisted take-off gear", comprising small liquid or solid fuel rockets on an aircraft, used to shorten the take-off run.

Rudder. A vertical control surface providing directional control.

S

Saw tooth. Applied to a wing leading edge as an alternative term for dog tooth (q.v.).

Servo tab. A small moving surface at the trailing edge of aileron, elevator or rudder which, when operated from the pilot's controls, causes the surface on which it is mounted to deflect in the opposite direction. Operation of the servo tab requires less force than would be needed to move the entire control surface.

s.h.p. Initials of "shaft horse power", the actual power generated by an engine at the propeller shaft after deducting losses due to friction, auxiliary drives, etc.

Shock body. Sometimes used inaccurately for anti-shock body (q.v.).

Shock stall. A stall (loss of lift) occurring at transonic speeds because of the change in pressure distribution over the wing attributable to shock waves formed at high speeds.

Simulator. A mechanical or electro-mechanical device to simulate the flight deck characteristics and instrument presentation of an aircraft, in order to give training to the crew in operating procedures and emergencies.

Ski. A type of landing gear suitable for use on snow or ice.

Slab tail. A tailplane which operates as a single entity to give longitudinal control, instead of having separate elevators. Used on high-speed aircraft.

Slat. A small section of a wing leading edge which can be moved forward, to produce a slot between it and the wing. This improves the airflow at low speeds, giving better control.

Slipper tank. A type of external fuel tank, fitting flush to the fuselage or wing undersurface.

Slot. A gap through the leading edge of the wing, serving to control the airflow and so reduce stalling speed and improve control. A fixed slot is incorporated in the leading edge and is permanently open; a valved slot is similar but is closed by doors for cruising flight; a controlled or retractable slot is formed by a slat which is moved away from the leading edge as required.

Slotted flap. A wing trailing edge flap so designed that the gap between it and the wing (when the flap is put down) acts as a flow-controlling slot.

Sonic boom. The noise produced by the shock wave set up by an aircraft flying above the speed of sound.

Sono-buoy. An air-dropped buoy with noise detecting hydrophones. Used to detect submarines, the sono-buoy transmits information on under-water noises by radio to patrolling aircraft.

s.f.c. Specific fuel consumption—the amount of fuel used by an engine, measured in terms of weight per hour per unit of power (lb. thrust, e.h.p. or b.h.p.).

Speed brake. Alternative term for air brake (q.v.).

Speed capsule. A term sometimes used for an anti-shock body (q.v.).

Split flap. A type of trailing edge flap fitting into the underside of the wing, and leaving the top wing surface undisturbed when extended.

Spoiler. A control surface, usually inset on the wing, to interrupt the airflow and destroy lift. Used as air brakes, lift dumpers and, differentially, to supplement aileron power for lateral control at high speeds.

Sponson. A stub-wing on the side of a flying-boat hull to give extra floatation.

Spring tab. A small auxiliary section on a control surface, combining the functions of balance tab and servo tab (q.v.).

Stabiliser. American term for the horizontal tailplane.

Stall. The condition resulting from a sudden loss of lift of a wing, when speed is reduced to the point where airflow ceases to be smooth.

Static thrust. The customary measure of a jet engine's power output, being the forward thrust of the engine in lb. when it is stationary. Thrust varies with speed, altitude and air temperature.

Statute mile. The standard British mile, being 1,760 yards.

S.T.O.L. Initials of "short take-off and landing", a term applied rather indiscriminately to any aircraft having comparatively good field performance. The U.S. Air Force defines S.T.O.L. as the ability to reach an altitude of 50 ft. within 500 ft. of the start of the take-off run.

Stores. Applied to various types of offensive armament and equipment carried externally or internally by a military aircraft.

Subsonic. Any speed below the speed of sound; less than Mach 1.

Supercirculation. The system of controlling the airflow, by suction or by blowing, over flaps or the complete wing and tail surfaces, in order to achieve laminar flow (see also B.L.C.).

Sweep-back. The angle between the lateral axis of an aeroplane and its wings, usually measured at 25% of the wing chord.

T

Tab. A small portion at the trailing edge of an aileron, elevator or rudder. See trim, balance, servo and spring tabs.

Tail boom. A slender structure extending from the wing to carry the tail unit in aircraft of twin-boom layout.

Tail parachute. Usually refers to a braking parachute (q.v.) but can also refer to an anti-spin parachute.

Tailplane. The horizontal stabilising surface at the rear of an aircraft, to which the elevators are usually attached.

Taper. The extent to which a wing is reduced in chord from root to tip. In rare cases, the chord *increases* from root to tip; this is known as inverse taper.

T.A.S. True air speed—the actual speed of an aircraft through the air, without allowance for headwind or tailwind which affect the speed over the ground.

t.e.h.p. Total equivalent horse power—an alternative form for e.h.p. (q.v.).

Thermal barrier. Loosely used in the same sense as heat barrier (q.v.).

Thickness/chord ratio. The ratio of the thickest part of a wing aerofoil section to the chord of the section. For very high speeds, thin wings are used with t/c ratios down to about 1 : 25. Ratios are usually quoted in percentages, a 1 : 25 ratio being described as a 4% wing.

Thrust. The force that moves an aircraft forward through the air, overcoming the drag. Also used in relation to the power produced by a jet engine (see static thrust).

Tip stall. A phenomenon of swept-back wings, the tips of which stall before the inner portions at low forward speeds, because of a spanwise shift of the boundary layer.

Transonic. The range of speeds just below and just above Mach 1, at which an aircraft may experience buffeting, trim changes and other effects of shock waves.

Trim tab. A small tab at the rear of a control surface which can be adjusted to exert a small, constant pressure in any required direction, so correcting any tendency to fly nose or wing high or low.

Triphibian. A made-up word to describe an aircraft capable of operation, without modification, from land, snow, ice or water.

Toss-bombing. Popular description of L.A.B.S. (q.v.).

Torsion-box. The main load-carrying portion of a multi-spar wing, comprising front and rear spars, ribs and skin. Frequently contains integral fuel tanks.

V

Vapour trail. Alternative term for contrail.

Ventral. Indicating the location, below and to the rear, of an external fuel tank or a fin.

V.F.R. Visual flight rules, the procedure employed for flying in V.M.C. (q.v.) as opposed to I.F.R.

v.i. tail. A tailplane, the incidence (angle of attack) of which can be varied either on the ground or in flight for trimming and control purposes.

V.M.C. Visual meteorological conditions, in which pilots may fly according to V.F.R. See also I.M.C.

Vortices. Rotating air flow behind a wing, caused by the mixing of the air flow from above and below the wing at slightly different angles.

Vortex generators. Small aerofoil surfaces, at right angles to the wing, tailplane or fin skin, to generate vortices at selected points to improve controllability.

V.T.O.L. Initials of "vertical take-off and landing", defined as the ability of an aircraft to reach an altitude of 50 ft. within 50 ft. distance of the take-off point.

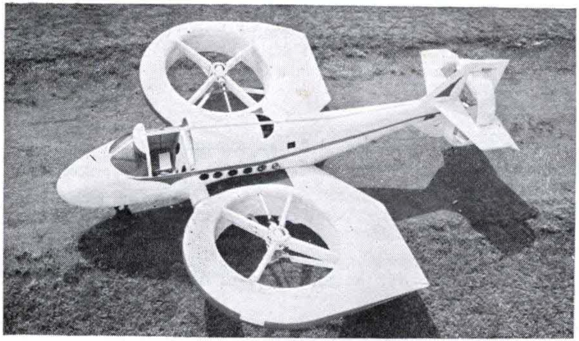
W

Whitcomb bumps. Alternative term for anti-shock body (q.v.), from the name of the N.A.S.A. engineer who developed the theory.

Y

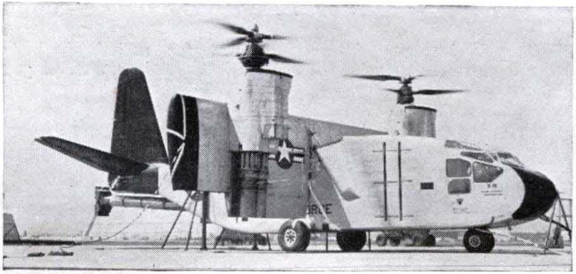
Yaw damper. An automatic device to operate the rudder of an aircraft to correct yaw and prevent snaking and Dutch rolling.

Youngman flap. A type of split trailing edge flap, which can be set in various positions.



(Above) The Vanguard Model 2C Omniplane utilises ducted rotors within the wings and driven by a 265 h.p. Lycoming O-540 to attain V.T.O.L. characteristics. (Below) The Hiller X-18 uses the pivoting-wing principle to provide V.T.O.L. characteristics as well as a high forward speed

Anti-torque rotor. A small rotor system usually vertically-mounted at some distance from the centre of gravity and parallel to the longitudinal axis of the fuselage of a helicopter, to generate a thrust in the opposite direction to the torque due to the main rotor.



Autogyro. A rotorcraft which derives lift for part or all of its flight from an unpowered rotor system, and has an independent forward propulsion system. The form "Autogiro" was the registered trade mark of Juan de la Cievra.

Autorotation. The " free-wheeling " motion of a rotor system due to the flow of air through it in free flight, when no power is being applied.

Co-axial rotor. A helicopter configuration in which two rotor systems are mounted co-axially on a common shaft and rotate in opposite directions.

Coleopter. An aircraft with a barrel-shaped wing, which takes off vertically on jet lift and tilts its main axis from vertical to horizontal for cruising flight.

Collective pitch. A term applicable to helicopter and autogyro blades, referring to their pitch setting or angle. The collective pitch control is one of the primary pilot controls in a light helicopter and varies the pitch of all the rotor blades simultaneously and by the same amount.

Convertiplane. By popular definition, any type of aircraft which in the course of a single flight substantially varies its mode of lift and thrust. The Federation Aeronautique Internationale defines a convertiplane more narrowly as a rotorplane which uses a power driven rotor system for vertical and hovering flight and a fixed wing surface to obtain the major portion of lift in forward flight.

Disc area. The area of the circle inscribed by the tips of the rotor blades on a helicopter or autogyro.

Ground-effect machine (G.E.M.). An alternative term to hovercraft for machines which move over the terrain on a cushion of air.

Gyrocopter. An alternative form of autogyro or gyroplane.

Gyrodyne. A rotorcraft in which power is supplied to the rotor system and which also has a propulsive airscrew, rotor or jet thrust.

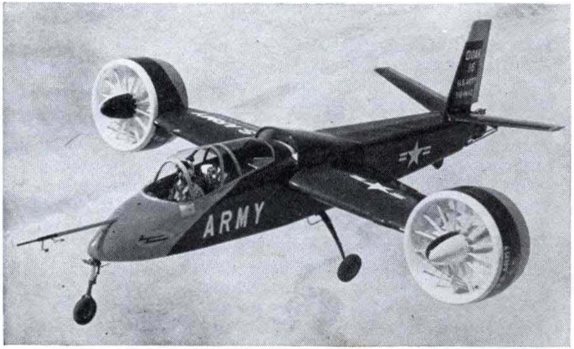
Gyroglider. A gyroplane or autogyro which has no self-contained means of propulsion, and is towed into the air behind another aircraft, an automobile or a motor boat.

Gyroplane. An alternative form of " autogyro ".

Helicopter. A rotorcraft which, for the whole of its flight, derives the major part of its lift from a powered rotor system whose axis or axes are fixed and are substantially perpendicular to the longitudinal axis of the rotorcraft.

Hovercraft. Used loosely to describe any type of machine which rides over the terrain on a cushion of air but has no means of generating lift and therefore does not fly in the strict sense.

Intermeshing rotor. A helicopter configuration with two rotor systems alongside each other, the main shafts being inclined outwards at a small angle to the vertical, and the rotor blades intermeshing as they rotate.



The Doak VZ-4DA has ducted airscrews which, driven by an 840 s.h.p. Lycoming YT53, pivot at the wing tips to function as helicopter rotors for take-off and landing and as conventional airscrews for forward flight

Jet deflection. The technique of temporarily deflecting the exhaust from a jet engine from the horizontal to the vertical or near vertical to provide upward propulsion.

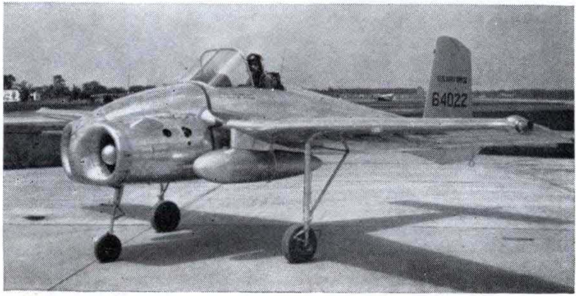
Jet-lift. The use of thrust from a jet engine in the vertical plane to allow a conventional fixed-wing aircraft to take off and land vertically and to hover.

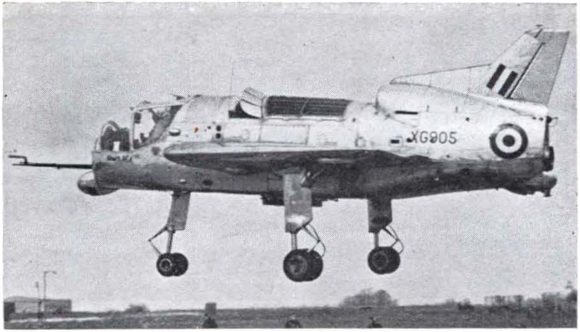
Jump-start autogyro. An autogyro in which power can be applied to the rotor system prior to take-off to permit a vertical or " jump " start, after which the rotor autorotates and power is applied to the propeller.

(Above) The Ryan VZ-3RY Vertiplane uses a deflected slipstream system, a 1,000 s.h.p. Lycoming T53-L-1 driving two large airscrews, flaps diverting the slipstream downwards for near-V.T.O.L. operation. (Below) The Bell X-14, now fitted with two General Electric J85s, uses the jet-deflection principle, thrust diverters deflecting engine thrust downwards

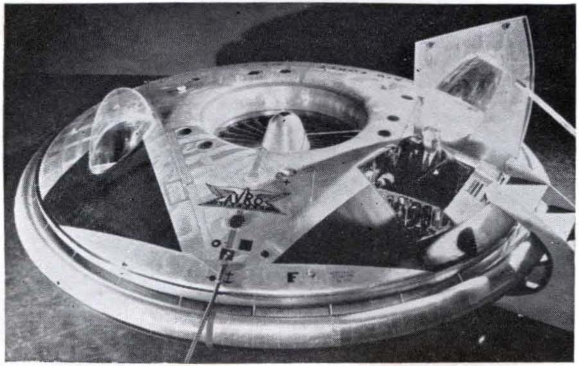
Ornithopter. An aeroplane supported in flight principally by wings or planes to which a flapping motion is imparted; this movement of the wings produces lift without forward motion being necessary.

Puff-pipe. The term applied to small nozzles at the front and rear, and at each wing-tip, of a jet-lift aircraft, through which compressed air is ejected to provide a means of lateral and





(Above) The Short SC.1 was the first British V.T.O.L. fixed-wing aircraft to perform the first complete transition from vertical to forward flight and vice versa. It employs four RB.108s for lift and a fifth for forward flight. (Below) The Avro VZ-9V Avrocar has three Continental J69s to drive a central fan providing a peripheral air curtain and ground cushion for V.T.O.L. operation



longitudinal control in the vertical phases of flight when there is little or no airflow of the conventional ailerons, elevators and rudder.

Rotor. An external wing-like surface of narrow chord. A rotor system comprises from two to six rotor blades carried radially on a single vertical shaft to produce lift when rotated.

Rotorcraft. Any type of aerodyne (heavier-than-air craft) which is sustained in flight primarily by the lift from a rotor system.

Tandem rotor. A helicopter configuration in which two rotor systems are mounted one behind the other longitudinally on the fuselage. This arrangement provides a longer fuselage with fewer c.g. and loading problems for airline-type helicopters.

Tilt-wing convertiplane. An aeroplane or rotorcraft which takes off vertically with the fuselage horizontal but the wings and propellers or rotors substantially vertical, and flies forward with the wings and propellers or rotors tilted to a horizontal axis.

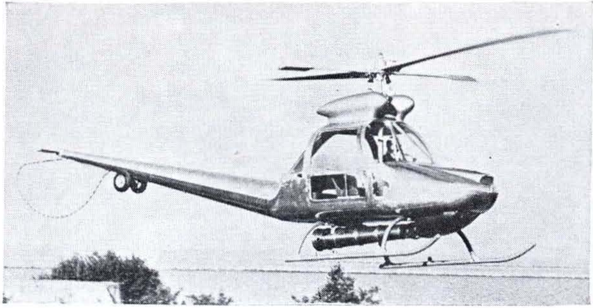
Tilting rotor. A rotor or rotor system in which the blades are attached to the hub in such a way as to permit a tilting or see-saw motion. Also, a rotor or rotor system the axis of which is vertical for take-off, landing and hovering, and is tilted to horizontal for cruising flight, in which condition the rotors provide forward thrust and conventional wings provide lift.

Tip-jet. A jet unit located at the tip of a rotor blade, either for primary propulsion or as a power booster. Types of tip-jet unit include pulse-jets and ram-jets in which air is taken in at the rotor tip, mixed with fuel and burnt; pressure jets, in which fuel is mixed with compressed air ducted down the blades from an engine in the aircraft; and cold jets in which compressed air is ducted down the blades and ejected without further combustion.

Torque. As applied to a helicopter, refers to the moment of the forces which tend to rotate the main structure in the opposite direction to the rotation of the main vertical power shaft.

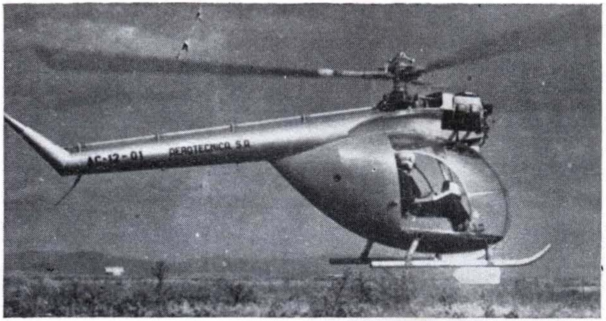
Vertiplane. Defined by the F.A.I. as a rotorcraft which takes off and lands vertically by means of a powered rotor system with its axis (or axes) parallel to the longitudinal axis of the aircraft, and flies horizontally with the aid of fixed wings after the longitudinal axis of the rotorcraft has been tilted over to a horizontal attitude.

V.T.O.L. Vertical Take-Off and Landing.



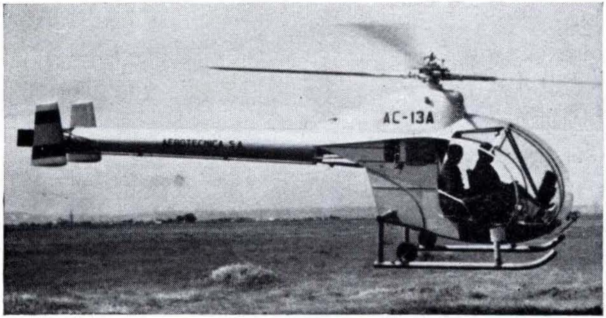
AER LUALDI L.59

Country of Origin: Italy.
Type: Four-seat Light General-purpose Helicopter.
Power Plant: One Continental IO-470-D six-cylinder horizontally-opposed engine rated at 260 h.p.
Performance: Maximum speed, 99 m.p.h.; cruising speed, 86 m.p.h.; maximum climb rate, 820 ft./min.; hovering ceiling (out of ground effect), 5,575 ft.; absolute ceiling, 19,355 ft.; endurance, 3 hr. 30 min.
Weights: Empty, 1,477 lb.; loaded, 2,557 lb.
Dimensions: Rotor diameter, 34 ft. 9½ in.; fuselage length, 29 ft. 9½ in.; overall height, 9 ft. 8 in.
Development: The Lualdi L.59 is a four-seat development of the two-seat L.55 and L.57 helicopters, and two prototypes have been built by the Macchi factory at Varese. The L.59, like its predecessors, incorporates the "Rotor-Matic" type of rotor system evolved by the Hiller Helicopter Corporation, and this is supplemented by a Lualdi gyroscopic system which is claimed to ensure smoother flight and easier handling qualities. It is proposed to build an initial series of fifty production machines.



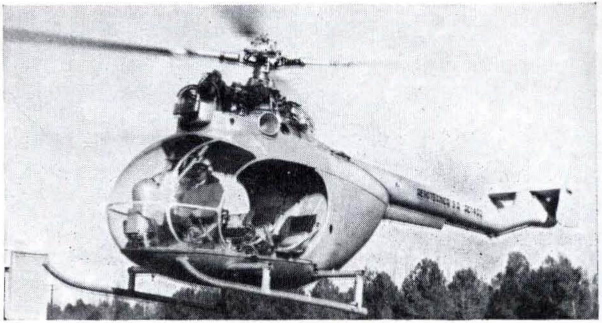
AEROTECNICA AC-12

Country of Origin: Spain.
Type: Two-seat General-purpose Helicopter.
Power Plant: One Lycoming O-360-B2A four-cylinder horizontally-opposed engine rated at 168 h.p.
Performance: Maximum speed, 87 m.p.h. at sea level; cruising speed, 71 m.p.h.; maximum inclined climb rate, 985 ft./min.; hovering ceiling (in ground effect), 7,875 ft.; service ceiling, 14,100 ft.
Weights: Empty, 1,058 lb.; loaded, 1,650 lb.
Dimensions: Rotor diameter, 27 ft. 10 in.; fuselage length, 24 ft. 9 in.; overall height, 9 ft.
Development: Derived from the AC-11 which, as the MATRA-Cantinieau M.C.101, flew in 1952, the AC-12 first flew on July 20, 1956, and a production series of twelve helicopters of this type has been ordered by the Spanish government. The transmission and reduction gear of the AC-12 are designed on automobile principles, and the engine is mounted above the cabin. An improved version of the AC-12, the AC-15 with a 245–260 h.p. Lycoming engine is under development.



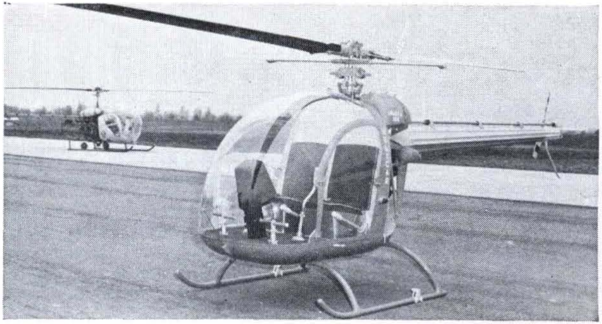
AEROTECNICA AC-13A

Country of Origin: Spain.
Type: Three-seat General-purpose Helicopter.
Power Plant: One Turboméca Artouste I shaft turbine rated at 260 e.h.p.
Performance: Maximum speed, 87 m.p.h.; cruising speed, 77 m.p.h.; maximum inclined climb rate, 905 ft./min.; hovering ceiling (in ground effect), 8,700 ft.; service ceiling, 19,900 ft.; range, 87–215 mls.
Weights: Empty, 1,265 lb.; loaded, 1,940 lb.
Dimensions: Rotor diameter, 30 ft. 9 in.; fuselage length, 24 ft. 7 in.; overall height, 9 ft.
Development: Developed in parallel with the AC-12, the AC-13A has a shaft turbine mounted aft of the cabin. The jet exhaust provides some 22 lb. thrust for anti-torque purposes. Two prototypes of the AC-13A were built in France by the S.N.C.A. du Nord as the Nord 1750 Norelfe, but the French licence has now lapsed and the two prototypes have been purchased by the Spanish government for use in the development of the AC-14. No series production of the AC-13 has been undertaken.



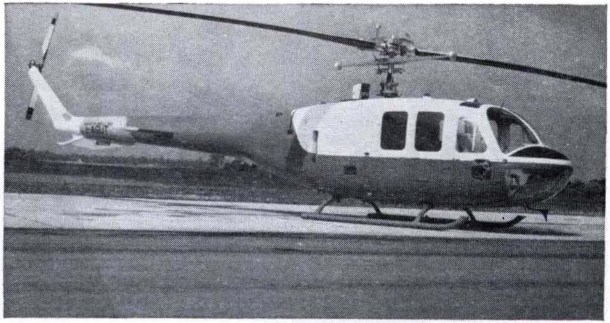
AEROTECNICA AC-14

Country of Origin: Spain.
Type: Five-seat Agricultural, Ambulance and Transport Helicopter.
Power Plant: One Turboméca Artouste IIB shaft turbine rated at 360 e.h.p.
Performance: Maximum speed, 112 m.p.h. at sea level; cruising speed, 99 m.p.h.; maximum inclined climb rate, 985 ft./min.; hovering ceiling (in ground effect), 16,075 ft.; service ceiling, 22,300 ft.
Weights: Empty, 1,367 lb.; loaded, 2,645 lb.
Dimensions: Rotor diameter, 31 ft. 6 in.; fuselage length, 26 ft. 8 in.; overall height, 10 ft. 2 in.
Development: Evolved from the three-seat AC-13A, the AC-14 flew for the first time on July 16, 1957, and a pre-production series of six machines have been built. The Artouste shaft turbine is mounted above the cabin, and residual thrust is used to increase forward speed. Anti-torque and directional control are provided by the movable tail fins. A scaled-up helicopter based on the AC-14, the AC-21 with two Turmo IIIs, is currently under construction.



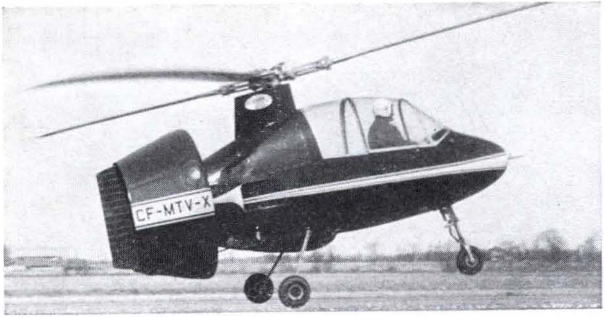
AGUSTA A 104 HELICAR

Country of Origin: Italy.
Type: Two-seat Light General-purpose Helicopter.
Power Plant: One Agusta M.V.A.120 four-cylinder horizontally-opposed engine rated at 140 h.p.
Performance: Maximum speed, 103 m.p.h. at sea level; cruising speed, 84 m.p.h.; maximum inclined climb rate, 787 ft./min.; hovering ceiling (in ground effect), 9,840 ft.; maximum range, 205 mls.
Weights: Empty, 838 lb.; loaded, 1,411 lb.
Dimensions: Rotor diameter, 26 ft. 1 in.; fuselage length, 20 ft. 10 in.; overall height, 7 ft. 7¾ in.
Development: Intended for reconnaissance, liaison, and agricultural duties, the A 104 Helicar has been developed from the smaller A 103 single-seater with an 85 h.p. Agusta M.V.G.A.70 engine. The A 103 flew for the first time in October 1959, and the A 104 followed in 1960. A feature of the A 104 is the extreme ease with which it may be assembled and disassembled. For normal operations the engine is derated to 120 h.p., providing a reserve power to ensure good hovering capabilities at altitude.



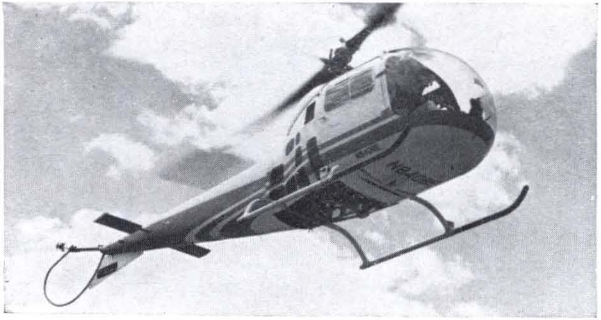
AGUSTA-BELL 102

Country of Origin: Italy.
Type: Eight/ten-seat Transport Helicopter.
Power Plant: One Pratt and Whitney R-1340 seven-cylinder radial air-cooled engine rated at 600 h.p.
Performance: Maximum speed, 120 m.p.h. at sea level; cruising speed, 99 m.p.h. at 600 ft.; maximum inclined climb rate, 1,100 ft./min.; hovering ceiling (in ground effect), 9,500 ft.; endurance, 3 hr. 20 min.
Weights: Empty, 3,990 lb.; loaded, 6,217 lb.
Dimensions: Rotor diameter, 47 ft. 7 in.; fuselage length, 41 ft. 9 in.; overall height, 10 ft. 7 in.
Development: Flown for the first time on February 3, 1959, the Agusta-Bell 102 is a redesigned version of the unsuccessful Bell Model 48. In the ambulance rôle it can carry four stretcher patients and a medical attendant, and in the all-freight rôle a maximum load of 1,940 lb. may be carried either internally or externally. The Agusta-Bell 102 is also suited for various military rôles, and an electric winch may be fitted for search and rescue duties. The Bell-type two-blade rotor and stabiliser bar is employed.



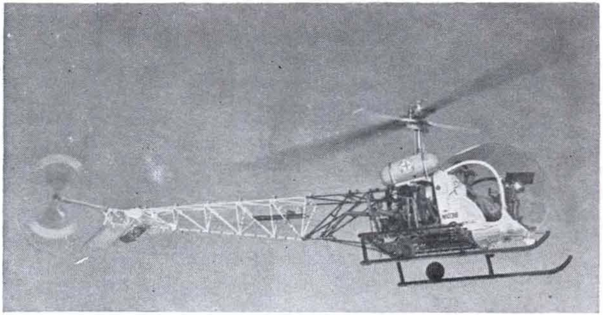
AVIAN 2/180

Country of Origin: Canada.
Type: Two/three-seat Gyroplane.
Power Plant: One Lycoming O-360-A four-cylinder horizontally-opposed engine rated at 180 h.p.
Performance: (Estimated) Maximum speed, 165 m.p.h.; economical cruising speed, 135 m.p.h.; vertical climb rate, 1,000 ft./min. at sea level; service ceiling, 14,000 ft.; normal range, 400 mls. at 135 m.p.h.
Weights: Empty, 1,090 lb.; normal loaded, 1,720 lb.
Dimensions: Rotor diameter, 33 ft.; fuselage length, 15 ft. 5 in.; overall height, 8 ft. 7 in.
Development: The Model 2/180 is a gyroplane with vertical take-off and landing capability, and the first prototype flew in the Spring of 1960. This was subsequently seriously damaged in an accident, but a second prototype has since been built. Whereas the prototype, the Model 2/180B, has shaft drive to the rotor, the production model, the 2/180A, will have compressed air nozzles at the blade tips and no form of mechanical drive. The prototype of the Avian 2/180 was designed and built within seven months.



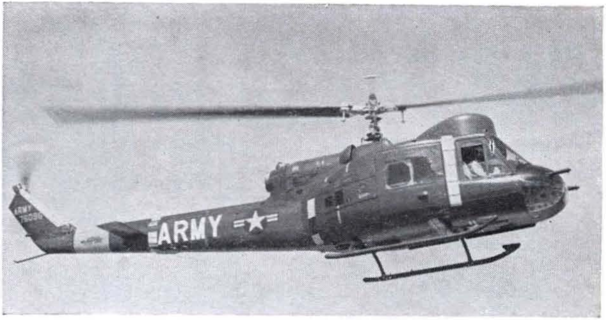
BELL MODEL 47J-2

Country of Origin: U.S.A.
Type: Four-seat General-purpose Helicopter.
Power Plant: One Lycoming VO-540-B1B six-cylinder horizontally-opposed engine derated to 240 h.p.
Performance: Maximum speed, 105 m.p.h.; cruising speed, 81 m.p.h. at sea level; maximum inclined climb rate, 800 ft./min.; hovering ceiling (in ground effect), 9,200 ft.; service ceiling, 12,100 ft.; max. range, 260 mls.
Weights: Empty, 1,730 lb.; max. loaded, 2,850 lb.
Dimensions: Rotor diameter, 37 ft. 1½ in.; fuselage length, 32 ft. 4¾ in.; overall height, 9 ft. 3½ in.
Development: The current production model of the 47J Ranger (Lycoming VO-435), the 47J-2 has metal rotor blades and hydraulic power controls. The HUL-1 is a U.S. Navy version of the Model 47J, the HUL-1C and HUL-1M being respectively a U.S. Coast Guard version and an experimental model with a 250 s.h.p. Allison YT63-A-3 shaft turbine. The HTL-7 is a U.S. Navy training model with a re-styled cabin, and the H-13J is a specially furnished version for the U.S. President. Two examples of the H-13J were delivered.



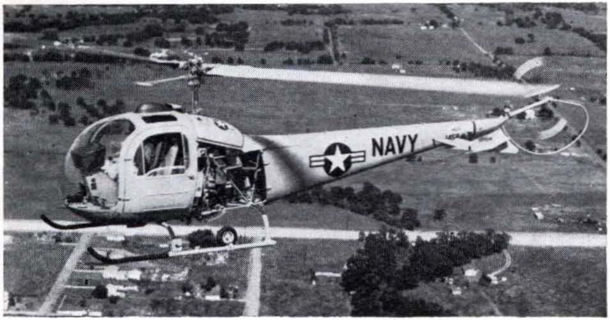
BELL MODEL 47G-3

Country of Origin: U.S.A.
Type: Three-seat Utility Helicopter.
Power Plant: One Franklin 6VS-335 six-cylinder horizontally-opposed engine rated at 225 h.p.
Performance: Maximum cruising speed, 105 m.p.h. at sea level; maximum speed at 15,000 ft., 110 m.p.h.; hovering ceiling (in ground effect), 18,500 ft.; service ceiling, 23,000 ft.; maximum range, 236 mls.
Weights: Empty, 1,539 lb.; loaded, 2,550 lb.
Dimensions: Rotor diameter, 37 ft. 3 in.; fuselage length, 28 ft. 6 in.; overall height, 9 ft. 3½ in.
Development: Flown for the first time on July 2, 1959, the Model 47G-3 is a development of the Model 47G-2 Trooper, from which it differs principally in having a greater rotor diameter, a lengthened tail boom and a supercharged engine. Production deliveries of the Model 47G-3 commenced in March 1960, and it is possible to convert the earlier Model 47G-2 to G-3 configuration. The G-3B has a Lycoming TVO-435 engine with an exhaust-driven supercharger. The Model 47G-2 is designated H-13H Sioux by the U.S. Army.



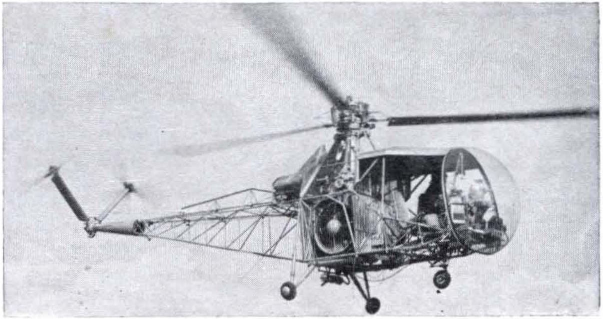
BELL HU-1A IROQUOIS

Country of Origin: U.S.A.
Type: Six-seat Utility Helicopter.
Power Plant: One Lycoming T53-L-1 free turbine derated to 770 s.h.p.
Performance: Maximum speed, 142 m.p.h.; cruising speed, 115 m.p.h.; maximum inclined climb rate, 2,100 ft./min.; hovering ceiling (in ground effect), 14,400 ft.; normal range, 186 mls.
Weights: Empty, 3,834 lb.; loaded, 5,800 lb.
Dimensions: Rotor diameter, 44 ft.; fuselage length, 39 ft. 7½ in.; overall height, 10 ft. 7 in.
Development: The Bell Model 204, or HU-1A Iroquois, is currently in production for the U.S. Army, deliveries having commenced in April 1960. A variant designated RH-2 (illustrated) is used to test high resolution radar which enables the pilot to see obstacles ahead of the helicopter, and an improved version, the HU-1B, has a T53-L-5 turbine rated at 960 s.h.p. and wider chord honeycomb main rotor blades. A commercial version, the Model 204B, is powered by a 1,100 s.h.p. T53-L-9 turbine.



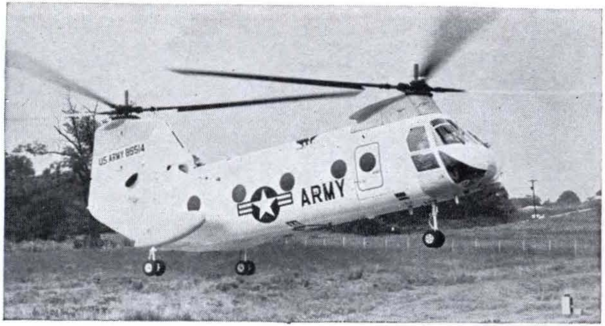
BELL HTL-7

Country of Origin: U.S.A.
Type: Two-seat Instrument Training Helicopter.
Power Plant: One Lycoming O-435-6 six-cylinder horizontally-opposed engine rated at 240 h.p.
Performance: Maximum speed, 103 m.p.h. at sea level; cruising speed, 80 m.p.h.; maximum inclined climb rate, 840 ft./min.; hovering ceiling (in ground effect), 8,200 ft.; service ceiling, 13,560 ft.
Weights: Empty, 1,916 lb.; loaded, 2,565 lb.
Dimensions: Rotor diameter, 37 ft. 2 in.; fuselage length, 32 ft. 5 in.; overall height, 9 ft. 4 in.
Development: Ordered into production in 1957, the HTL-7 is similar to the HUL-1 aft of the firewall but embodies a completely redesigned cabin containing all-weather instrumentation and dual controls. Employed by the U.S. Navy for both basic flying and instrument training, the HTL-7 has eliminated the need for two different helicopters to undertake these rôles. The first of an initial order for eighteen HTL-7 training helicopters was delivered to the U.S. Navy in December 1957.



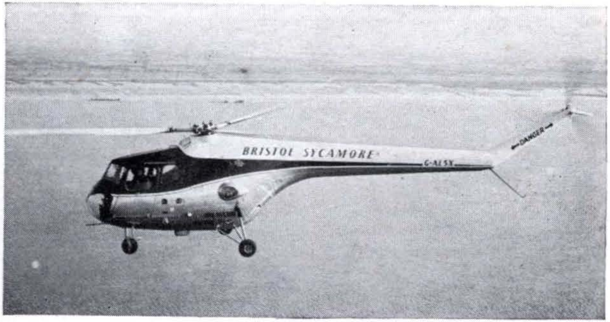
BORGWARD KOLIBRI I

Country of Origin: Germany.
Type: Three-seat Utility Helicopter.
Power Plant: One Lycoming VO-435-A1B six-cylinder horizontally-opposed engine rated at 260 h.p.
Performance: Maximum speed, 99 m.p.h.; cruising speed, 87 m.p.h.; maximum inclined climb rate, 787 ft./min.; hovering ceiling (out of ground effect), 1,950 ft.; absolute ceiling, 14,760 ft.
Weights: Empty, 1,830 lb.; loaded, 2,645 lb.
Dimensions: Rotor diameter, 30 ft. 10 in.; fuselage length, 27 ft. 2¾ in.; overall height, 9 ft. 10 in.
Development: Germany's first post-war helicopter of indigenous design, the Kolibri I, designed by Professor E. H. Focke, flew for the first time on July 8, 1958. Of conventional design, the first prototype has an uncovered fuselage, but later models are to have an enclosed fuselage, and it is anticipated that production will be initiated in 1961–2. The Kolibri I can carry one casualty litter internally and a second externally, and can be fitted with agricultural dusting or spraying equipment.



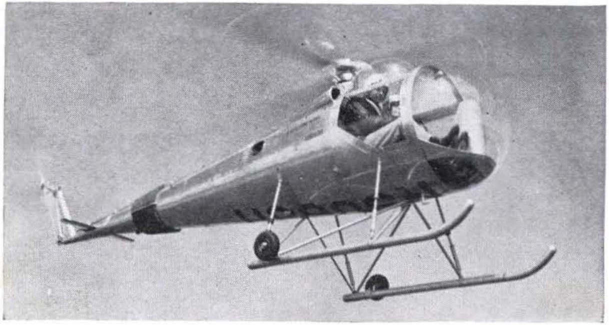
BOEING-VERTOL YHC-1A CHINOOK

Country of Origin: U.S.A.
Type: Medium Tactical Transport Helicopter.
Power Plants: Two General Electric T58-GE-6 free turbines derated to 825 s.h.p.
Performance: Maximum speed, 172 m.p.h.; maximum cruising speed (90% power), 145 m.p.h.; normal range (10% reserves and 3,000-lb. payload), 230 mls.; maximum range (no reserves), 390 mls.
Weights: Empty, 9,100 lb.; loaded, 15,550 lb.
Dimensions: Rotor diameter (each), 48 ft. 4 in.; fuselage length, 44 ft. 3½ in.; overall height, 17 ft. 7½ in.
Development: Derived from the commercial Model 107-II, the first of three Boeing-Vertol YHC-1A helicopters was flown on August 27, 1959, and these are serving as development machines for the larger YHC-1B which, powered by two 1,940 s.h.p. Lycoming YT55-L-5 turbines, began tests in May 1961. Twenty-eight YHC-1B and HC-1B Chinooks are currently on order for the U.S. Army, and twenty basically similar helicopters have been ordered for the Royal Swedish Navy. The YHC-1B has a rear-loading ramp.



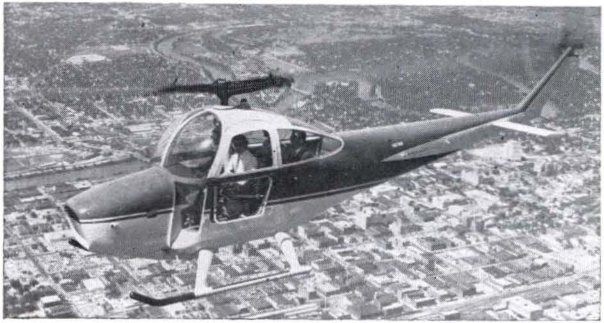
BRISTOL TYPE 171 SYCAMORE MK. 4

Country of Origin: Great Britain.
Type: Four/five-seat General-purpose Helicopter.
Power Plant: One Alvis Leonides Mk. 73 nine-cylinder radial engine rated at 520 h.p.
Performance: Maximum speed, 127 m.p.h. at sea level; economical cruising speed, 91 m.p.h. at 2,000 ft.; maximum inclined climb rate, 1,300 ft./min.; hovering ceiling (out of ground effect), 4,000 ft.
Weights: Empty, 4,060 lb.; loaded, 5,600 lb.
Dimensions: Rotor diameter, 48 ft. 6¾ in.; fuselage length, 46 ft. 2 in.; overall height, 12 ft. 2 in.
Development: A total of 178 Sycamore helicopters had been completed when production terminated in 1959, the final model being the Mk. 4. Military versions of the Mk. 4 included the Sycamore H.C.10 ambulance; H.C.11 observation and communications model for the British Army; H.R.12 search and rescue version for the R.A.F. Coastal Command; the basically similar H.R.13 for R.A.F. Fighter Command, and the H.R.14 general-purpose model for both the R.A.F. and the German armed forces.



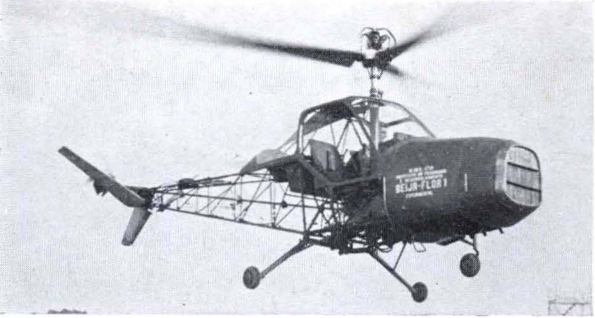
BRANTLY B-2

Country of Origin: U.S.A.
Type: Two-seat Light General-purpose Helicopter.
Power Plant: One Lycoming VO-360-A1A four-cylinder horizontally-opposed engine rated at 180 h.p.
Performance: Maximum speed, 100 m.p.h.; maximum climb rate, 1,580 ft./min.; hovering ceiling (in ground effect), 4,700 ft.; service ceiling, 10,400 ft.; range, 300 mls.
Weights: Empty, 980 lb.; loaded, 1,600 lb.
Dimensions: Rotor diameter, 23 ft. $11\frac{1}{4}$ in.; fuselage length, 19 ft. 4 in.; overall height, 6 ft. $11\frac{3}{4}$ in.
Development: The side-by-side two-seat B-2 was flown for the first time on February 21, 1953, and entered production in 1959, some seventy machines having been delivered by the end of 1960. Five B-2 helicopters have been delivered to the U.S. Army for evaluation under the designation YHO-3BR. Although the B-2 can be equipped for agricultural purposes, it is intended primarily as an executive or private owner type. A stressed-skin all-metal fuselage with a conical tail section provide exceptionally clean lines.



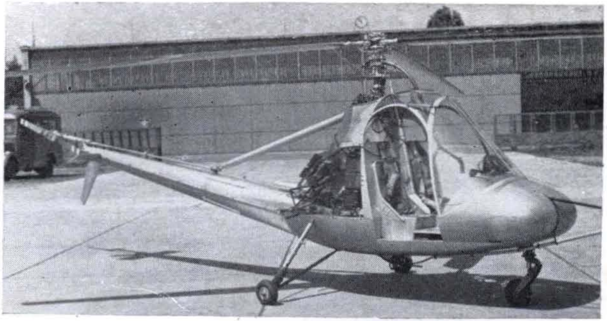
CESSNA CH-1C SKYHOOK

Country of Origin: U.S.A.
Type: Four-seat General-purpose Helicopter.
Power Plant: One Continental FSO-526-A six-cylinder horizontally-opposed engine rated at 270 h.p.
Performance: Maximum speed, 122 m.p.h. at sea level; cruising speed, 90–120 m.p.h.; maximum inclined climb rate, 950 ft./min.; hovering ceiling (in ground effect), 9,600 ft.; max. range, 400 mls.
Weights: Empty, 2,080 lb.; loaded, 3,100 lb.
Dimensions: Rotor diameter, 35 ft.; fuselage length, 29 ft. 5 in.; overall height, 8 ft. 5 in.
Development: The Skyhook has been developed from the Seibel S-4 Skyhawk (YH-24) acquired by the Cessna company when it absorbed the Seibel Helicopter Company in March 1952. The two-seat CH-1 first flew in July 1954, and further development resulted in the enlarged CH-1B, ten examples of which have been evaluated by the U.S. Army as the YH-41 Seneca. The CH-1C incorporates mechanical and aerodynamic changes, these providing complete static and dynamic stability.



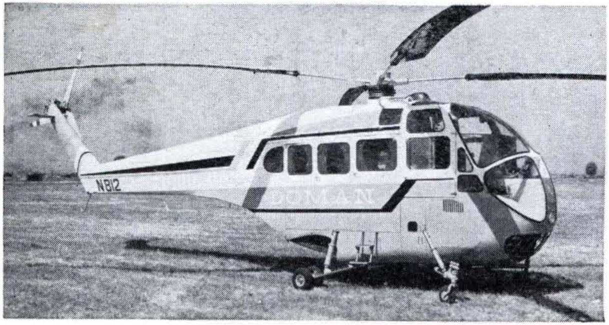
C.T.A. BEIJA-FLÔR 1

Country of Origin: Brazil.
Type: Two-seat Utility Helicopter.
Power Plant: One Continental E225 six-cylinder horizontally-opposed engine rated at 225 h.p.
Performance: Maximum speed, 93 m.p.h. at sea level; economical cruising speed, 81 m.p.h.; maximum inclined climb rate, 1,220 ft./min.; hovering ceiling (in ground effect), 8,800 ft.; range, 168 mls.
Weight: Loaded, 2,090 lb.
Dimensions: Rotor diameter, 29 ft. 6⅓ in.; fuselage length, 27 ft. 7¾ in.; overall height, 10 ft. 4 in.
Development: The Beija-Flôr (Humming Bird) has been built by the Centro Tecnico de Aeronautica to the designs of Professor E. H. Focke, and prototype trials commenced early in 1959. Indigenous materials are extensively employed in the structure of the Beija-Flôr, and a pre-production series of three improved models is currently in hand, these featuring lower structural weights than the prototype. Production of the Beija-Flôr is expected to be undertaken by Brazilian private industry.



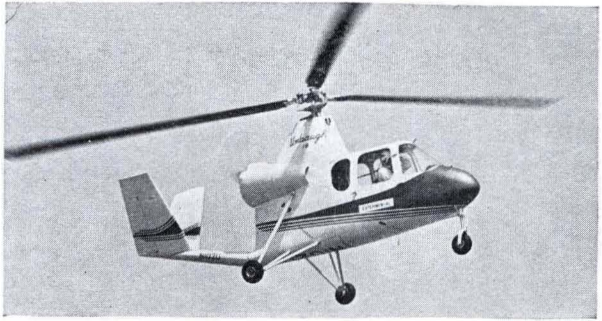
C.Z.L. HC-2 HELI-BABY

Country of Origin: Czechoslovakia.
Type: Two-seat Ultra Light Helicopter.
Power Plant: One Praga DH four-cylinder horizontally-opposed engine rated at 83 h.p.
Performance: Maximum speed, 78 m.p.h.; cruising speed, 62 m.p.h.; maximum inclined climb rate, 705 ft./min.; hovering ceiling (in ground effect), 3,940 ft.; service ceiling, 9,940 ft.; normal range, 93 mls.
Weights: Empty, 838 lb.; loaded, 1,279 lb.
Dimensions: Rotor diameter, 28 ft. 10 in.; fuselage length, 27 ft. 7¾ in.; overall height, 8 ft. 4 in.
Development: Designed by H. Slechta of the Central Bohemian Machine Works, the Heli-Baby has suffered somewhat protracted development, but a production series of two hundred machines powered by the new 110 h.p. M 110 four-cylinder engine is currently under construction. The Heli-Baby is intended for both civil and military rôles, and a five-seat development, the HC-3 powered by a 240 h.p. M 108H engine, is currently under development. The specification relates to the prototypes of the Heli-Baby.



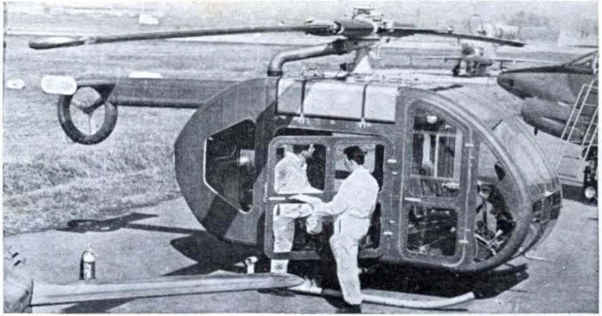
DOMAN LZ-5-2

Country of Origin: U.S.A.
Type: Seven-seat Utility Helicopter.
Power Plant: One Lycoming SO-580-A1B eight-cylinder horizontally-opposed engine rated at 400 h.p.
Performance: Maximum speed, 100 m.p.h. at sea level; cruising speed, 82 m.p.h.; maximum inclined climb rate, 1,190 ft./min.; hovering ceiling (in ground effect), 6,200 ft.; range, 380 mls.
Weights: Empty, 3,250 lb.; loaded, 5,200 lb.
Dimensions: Rotor diameter, 48 ft.; fuselage length, 37 ft. 10 in.; overall height, 10 ft. 5 in.
Development: The LZ-5 helicopter was flown for the first time on April 27, 1953, and received an approved type certificate on December 30, 1955. It has been evaluated by the U.S.A.A.F. as the YH-31, but no production order has been placed. Current plans call for the construction of an initial series of twenty-five LZ-5-2 helicopters in Italy by Aeronautica Sicula. The LZ-5-2 can be operated in stripped condition with fuselage covering and other non-structural parts removed, permitting a useful load of 2,250 lb.



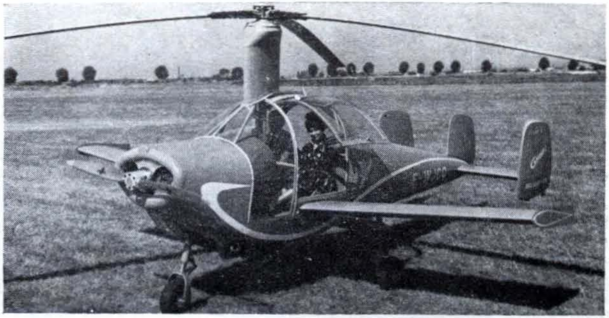
FAIRCHILD-UMBAUGH U-18

Country of Origin: U.S.A.
Type: Two-seat Light Gyroplane.
Power Plant: One Lycoming O-360 four-cylinder horizontally-opposed engine rated at 180 h.p.
Performance: Maximum speed, 126 m.p.h.; cruising speed (65% power), 100 m.p.h.; maximum climb rate, 1,050 ft./min.; service ceiling, 15,000 ft.; absolute ceiling, 17,000 ft.; range, 360 mls.; endurance, 3·5 hr.
Weight: Maximum loaded, 1,800 lb.
Dimensions: Rotor diameter, 35 ft.; approx. fuselage length, 25 ft.; approx. overall height, 11 ft. 6 in.
Development: The Umbaugh U-18 two-seat gyroplane is to be manufactured in quantity by the Fairchild Engine and Airplane Corporation. The Lycoming engine drives a pusher airscrew and the three-blade rotor is pre-rotated for vertical take-off. The rotor and control systems are extremely simple, having swashplate control for the blades, and as the rotor is not power-driven in flight no anti-torque system is necessary. Longitudinal and lateral control are effected by mechanically tilting the rotor plane.



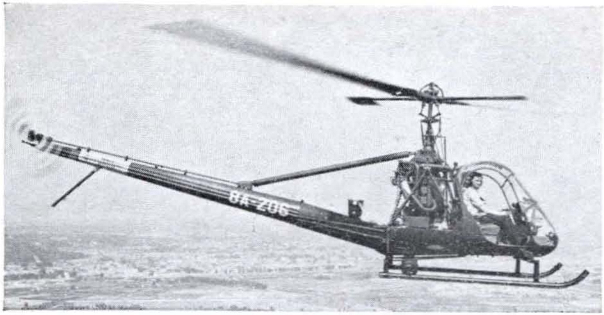
FIAT MODEL 7002

Country of Origin: Italy.
Type: Seven-seat Utility Helicopter.
Power Plant: One Fiat 4700 turbo-generator rated at 530 e.h.p.
Performance: Maximum speed, 106 m.p.h. at sea level; cruising speed, 84 m.p.h. at sea level; range, 187 mls.; service ceiling, 11,150 ft.
Weights: Empty, 1,320 lb.; normal loaded, 3,080 lb.
Dimensions: Rotor diameter, 39 ft. 4¾ in.; fuselage length, 20 ft. 6 in.; overall height, 9 ft. 5½ in.
Development: The Model 7002 is an extremely unconventional helicopter in which the two-blade main rotor is driven by cold jets, compressed air being supplied by the turbo-generator. Featuring exceptional structural simplicity, the fuselage is built up of light alloy sheets, and the standard cabin layout has dual controls plus two separate passenger seats and a bench seat accommodating a further three passengers. For ambulance duties, the fuselage can accommodate two casualty litters, and two additional litters may be carried externally.



HELICOP-AIR L.50 GIRHEL

Country of Origin: France.
Type: Two-seat Light Gyroplane.
Power Plant: One Continental C90-12F four-cylinder horizontally-opposed air-cooled engine rated at 95 h.p.
Performance: Maximum speed, 103 m.p.h.; cruising speed, 87 m.p.h.; minimum speed, 19 m.p.h.; service ceiling (at maximum loaded weight), 13,123 ft.; range (pilot and 220 lb.), 310 mls.
Weights: Empty, 838 lb.; loaded, 1,378 lb.
Dimensions: Rotor diameter, 32 ft. 9¾ in.; fuselage length, 20 ft. 0¼ in.; overall height, 8 ft. 10¼ in.
Development: The Girhel, which began trials in March 1960, was designed to participate in a government-sponsored competition for simple club aircraft. The three-blade rotor is started by the engine and is de-clutched as the wheel brakes are released, resulting in a jump-start type take-off. In forward flight the rotor autorotates. The L.51 will differ from the L.50 in having a 150 h.p. Lycoming 320-A1A, and a more powerful version with a Turboméca Orédon gas turbine is in the project stage.



HILLER UH-12E (H-23D RAVEN)

Country of Origin: U.S.A.

Type: Three-seat Utility Helicopter.

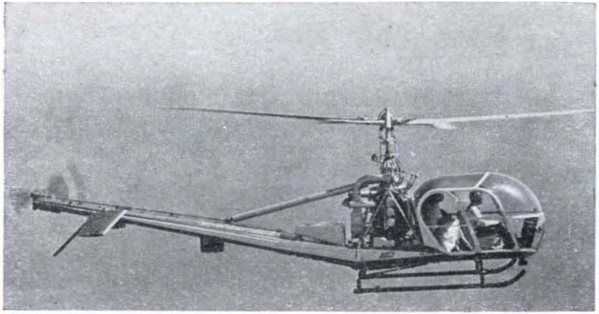
Power Plant: One Lycoming VO-540-A1B six-cylinder horizontally-opposed engine rated at 305 h.p.

Performance: Maximum speed, 95 m.p.h. at sea level; cruising speed, 82 m.p.h.; maximum inclined climb rate, 1,050 ft./min.; hovering ceiling (in ground effect), 5,200 ft.; service ceiling, 13,200 ft.

Weights: Empty, 1,816 lb.; loaded, 2,700 lb.

Dimensions: Rotor diameter, 35 ft. 5 in.; fuselage length, 27 ft. 11¼ in.; overall height, 9 ft. 9½ in.

Development: Developed from the Model 360 of 1946, the UH-12 has been built in large numbers, more than twelve hundred examples having been delivered by mid-1961. Variants include the H-23A, H-23B, H-23C and H-23D for the U.S. Army, and the HTE-1 and -2 for the U.S. Navy. The H-23D is more powerful than its predecessors, and the first prototype of this version flew on April 3, 1956, production deliveries commencing in December 1957. The H-23 serves with many of the world's air forces.



HILLER MODEL E4

Country of Origin: U.S.A.

Type: Four-seat General-purpose Helicopter.

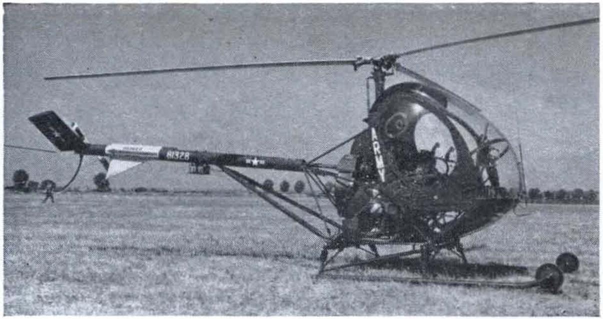
Power Plant: One Lycoming VO-540-A1A six-cylinder horizontally-opposed engine rated at 305 h.p.

Performance: Maximum speed, 96 m.p.h. at sea level; cruising speed (75% power), 88 m.p.h.; economical cruising speed, 84 m.p.h.; range, 225 mls. at 84 m.p.h.; maximum climb rate, 1,340 ft./min.; vertical climb rate, 820 ft./min.; service ceiling, 14,600 ft.; hovering ceiling (in ground effect), 9,550 ft.

Weights: Empty, 1,760 lb.; loaded, 2,750 lb.

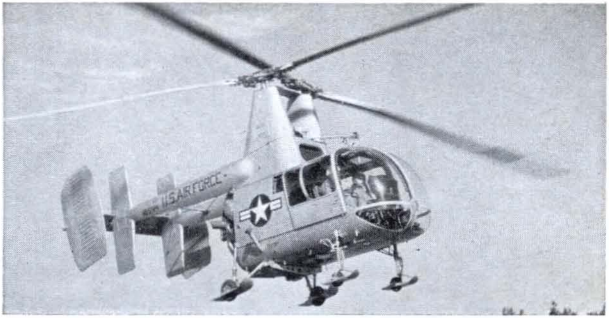
Dimensions: Rotor diameter, 35 ft. 4¾ in.; fuselage length, 29 ft. 10¾ in.; overall height, 9 ft. 9½ in.

Development: The Model E4 is derived from the three-seat Model UH-12E, the principal modification being the insertion of a 25-in. section into the standard UH-12E cockpit to increase accommodation. UH-12E helicopters can easily be converted to E4 configuration. A hydraulic cargo hoist, quick-release cargo sling, and cargo racks similar to those that may be provided for the UH-12E can also be fitted to the E4.



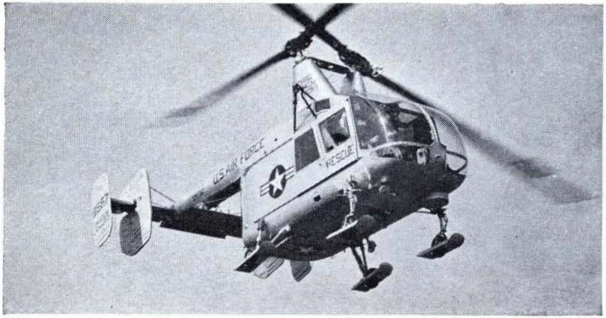
HUGHES 269A (YHO-2HU)

Country of Origin: U.S.A.
Type: Two-seat Ultra Light Helicopter.
Power Plant: One Lycoming O-360-C2B four-cylinder horizontally-opposed engine rated at 180 h.p.
Performance: Maximum speed, 90 m.p.h. at sea level; maximum cruising speed, 85 m.p.h.; maximum inclined climb rate, 1,450 ft./min.; hovering ceiling (in ground effect), 6,000 ft.; range, 195 mls.
Weights: Empty, 867 lb.; loaded, 1,550 lb.
Dimensions: Rotor diameter, 25 ft.; fuselage length, 22 ft. 4 in.; overall height, 7 ft. 11 in.
Development: Design of the Hughes 269 was initiated in September 1955, the first prototype flying in October 1956. An improved version, the Model 269A, has been evaluated by the U.S. Army as the YHO-2HU (illustrated), five helicopters of this type being purchased. The commercial version of the YHO-2HU has now been placed in commercial production, a delivery rate of one per day being anticipated by September 1961. The YHO-2HU can be adapted as a missile-launching platform.



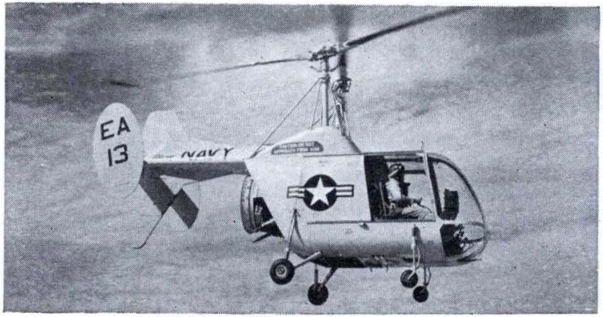
KAMAN H-43A

Country of Origin: U.S.A.
Type: Four-seat Local Crash Rescue Helicopter.
Power Plant: One Pratt and Whitney R-1340-43 radial air-cooled engine rated at 600 h.p.
Performance: Maximum speed, 119 m.p.h. at 4,000 ft.; cruising speed, 75 m.p.h.; maximum inclined climb rate, 1,300 ft./min.; hovering ceiling (in ground effect), 14,200 ft.; normal range, 220 mls.
Weights: Empty, 4,330 lb.; loaded, 7,850 lb.
Dimensions: Rotor diameter, 47 ft.; fuselage length, 25 ft.; overall height, 15 ft. 6½ in.
Development: A development of the basic Model 600 for service with the U.S.A.F., the H-43A is equipped with hoist, stretcher racks and a specially-designed fire-rescue kit, including 68 Imp. gal. of foam extinguishing chemical, hose, crowbars, etc. The first of eighteen H-43A helicopters was delivered to the U.S.A.F. in November 1958. The H-43A is basically similar to the HOK-1 utility helicopter of the U.S. Navy and Marine Corps apart from the engine and equipment.



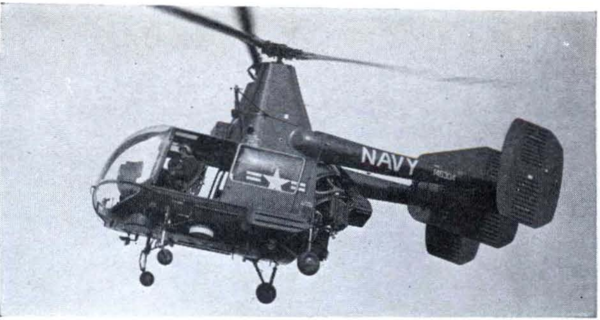
KAMAN H-43B HUSKIE

Country of Origin: U.S.A.
Type: Eight-seat Crash Rescue Helicopter.
Power Plant: One Lycoming T53-L-1A free turbine rated at 825 s.h.p.
Performance: Maximum speed, 107 m.p.h. at 6,800 ft.; normal range, 250 mls.; hovering ceiling (in ground effect), 20,000 ft.
Weights: Empty, 5,900 lb.; loaded, 7,100 lb.
Dimensions: Rotor diameter (each), 47 ft.; fuselage length, 25 ft.; overall height, 12 ft. 5 in.
Development: Flown for the first time on December 13, 1958, the H-43B Huskie is a development of the piston-engined five-seat H-43A, and 140 machines of this type have been ordered by the U.S.A.F., deliveries to be completed in 1961. Evolved primarily for the short-range rescue rôle, the H-43B Huskie has a hoist, litter racks, and a specially designed fire-rescue kit which includes 68 Imp. gal. of foam extinguishing chemical, hose, crowbars, axes, etc. Small aileron-like controls mounted on the rotor blades known as servo-flaps improve stability.



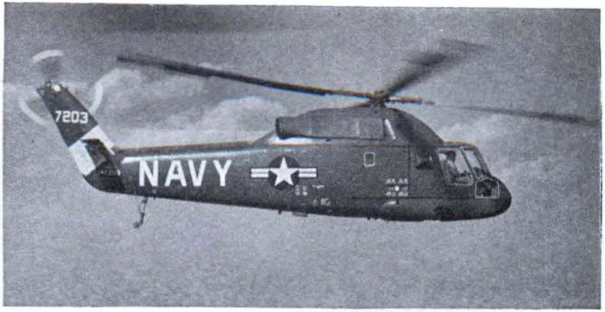
KAMAN HTK-1

Country of Origin: U.S.A.
Type: Two/three-seat Training Helicopter.
Power Plant: One Lycoming O-435-4 six-cylinder horizontally-opposed engine rated at 245 h.p.
Performance: Maximum speed, 81 m.p.h.; cruising speed, 70 m.p.h.; maximum inclined climb rate, 700 ft./min.; hovering ceiling (in ground effect), 6,700 ft.; service ceiling, 17,000 ft.; range, 120 mls.
Weights: Empty, 1,750 lb.; loaded, 3,100 lb.
Dimensions: Rotor diameter (each), 41 ft.; fuselage length, 20 ft. 6½ in.; overall height, 12 ft. 6 in.
Development: The HTK-1, or Model 240, entered service with the U.S. Navy and Marine Corps early in 1952. Employed primarily as a trainer, the HTK-1 has been used for anti-submarine duties and is adaptable as an ambulance, two stretchers being mounted one above the other on the port side of the cabin. The changeover from trainer to ambulance may be effected within 2·5 minutes, and the port side of the cabin nose opens to facilitate the loading of the stretchers.



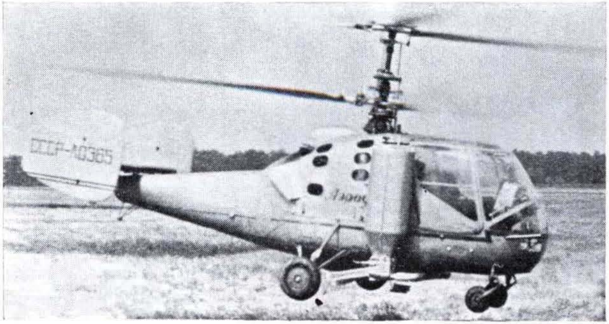
KAMAN HUK-1

Country of Origin: U.S.A.
Type: Four/five-seat General-purpose Helicopter.
Power Plant: One Pratt and Whitney R-1340-48 radial air-cooled engine rated at 600 h.p.
Performance: Maximum speed, 110 m.p.h. at 8,000 ft.; cruising speed, 75 m.p.h.; maximum inclined climb rate, 1,300 ft./min.; hovering ceiling (in ground effect), 12,000 ft.; normal range, 220 mls.
Weights: Empty, 4,040 lb.; max. loaded, 6,800 lb.
Dimensions: Rotor diameter, 47 ft.; fuselage length, 25 ft.; overall height, 15 ft. 6½ in.
Development: The HUK-1 is a utility version of the HOK-1 helicopter, the two types being basically similar. The winner of a U.S. Navy design contest, the HOK-1 was ordered into production in 1950 as a general-purpose helicopter, the first being accepted for service on April 28, 1953. It was succeeded in production by the HUK-1, deliveries of which terminated in 1959. The HUK-1 serves in the casualty evacuation, freight transportation, search and rescue, reconnaissance and personnel transportation rôles.



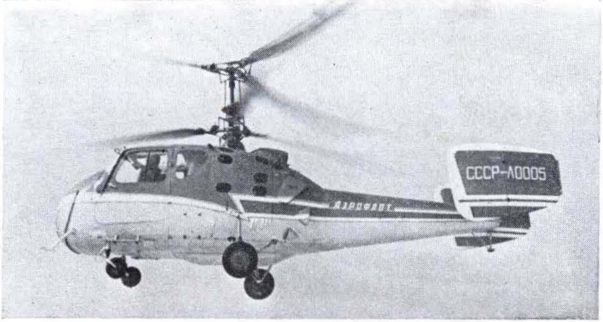
KAMAN HU2K-1 SEASPRITE

Country of Origin: U.S.A.
Type: Six-seat Utility and Search and Rescue Helicopter.
Power Plant: One General Electric T58-GE-6 free turbine rated at 1,024 s.h.p.
Performance: No details available for publication.
Weights: Empty, 5,052 lb.; loaded, 9,152 lb.
Dimensions: Rotor diameter, 44 ft.; fuselage length, 37 ft.; overall height, 12 ft. 5 in.
Development: Designed to meet U.S. Navy requirements for an all-weather utility helicopter, the HU2K-1 Seasprite was flown for the first time on July 1, 1959, and four prototypes were followed by a pre-production batch of twelve machines, the first of which was completed in January 1960. It is anticipated that, providing fleet trials to take place in 1961 are successful, between 250 and 300 Seasprites will be required by the U.S. Navy. These will be employed primarily for search, rescue, utility and high-speed liaison roles, but the Seasprite is capable of carrying up to thirteen combat troops or four casualty litters.



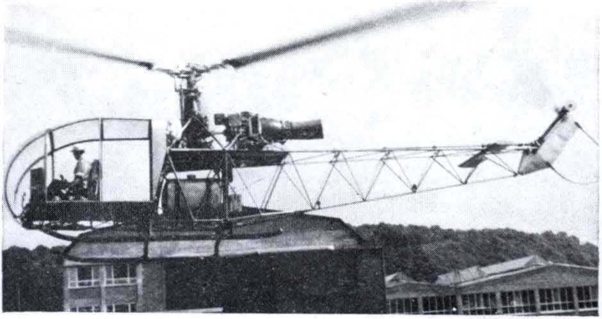
KAMOV KA-15 (HEN)

Country of Origin: U.S.S.R.
Type: Two-seat Light Utility Helicopter.
Power Plant: One Ivchenko AI-14V nine-cylinder radial air-cooled engine rated at 255 h.p.
Performance: Maximum speed, 93 m.p.h.; cruising speed, 73 m.p.h.; hovering ceiling (out of ground effect), 2,230 ft.; service ceiling, 9,840 ft.; normal endurance, 2 hr. 30 min.
Weights: Empty, 1,760 lb.; loaded, 2,500 lb.
Dimensions: Rotor diameter, 32 ft. 8$\frac{1}{2}$ in.; fuselage length, 19 ft. 6 in.; overall height, 10 ft. 10 in.
Development: The Ka-15, which employs the same rotor configuration as the earlier Ka-10 and Ka-10M helicopters which, known as "aerial motorcycles", were first demonstrated in 1952, has been manufactured in substantial numbers for agricultural duties, and for the Soviet Navy as a shipboard anti-submarine helicopter. The Ka-15 appeared for the first time in 1956, and established two F.A.I.-recognised Class E-1-c records for speed over 100-km. and 500-km. closed circuits.



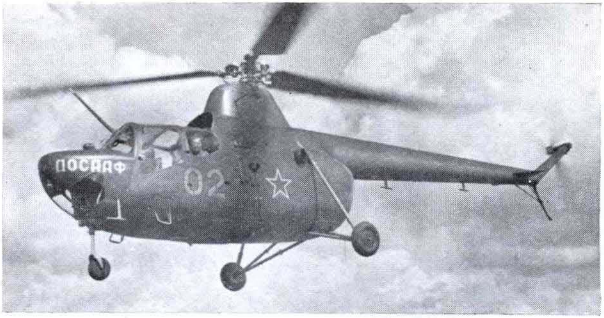
KAMOV KA-18 (HOG)

Country of Origin: U.S.S.R.
Type: Four-seat Utility Helicopter.
Power Plant: One Ivchenko AI-14VF nine-cylinder radial air-cooled engine rated at 275 h.p.
Performance: Maximum speed, 99 m.p.h.; maximum cruising speed, 81 m.p.h.; service ceiling, 11,483 ft.; range (three passengers and 20 min. reserves), 186 mls.; normal endurance, 4 hr. 30 min.
Weights: Empty, 2,275 lb.; loaded, 3,311 lb.
Dimensions: Rotor diameter, 32 ft. 8$\frac{1}{8}$ in.; fuselage length, 23 ft. 0$\frac{3}{4}$ in.; overall height, 10 ft. 11$\frac{1}{2}$ in.
Development: Flown for the first time in mid-1957, the Ka-18 is a development of the two-seat Ka-15, and the initial production version had a similar 255 h.p. engine. The Ka-18 serves in a variety of rôles, and an ambulance version features a special stretcher loading door in the nose. Many Ka-18s are assigned to local administrative bodies, and the type is employed by Aeroflot for taxi services. Full equipment is available for bad weather and night flying, and inflatable pontoons can be fitted.



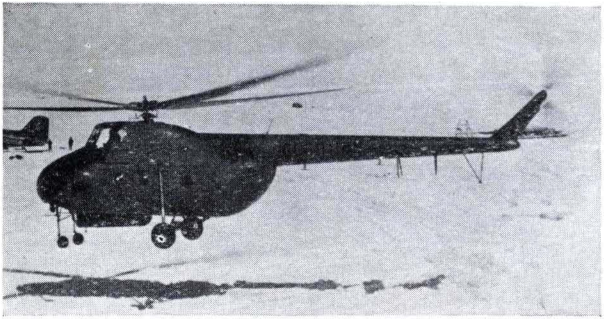
MERCKLE SM 67

Country of Origin: Germany.
Type: Five-seat General-purpose Helicopter.
Power Plant: One Turboméca Artouste IIB shaft turbine rated at 396 e.h.p.
Performance: No details available for publication.
Weights: No details available for publication.
Dimensions: Rotor diameter, 34 ft. 5⅓ in.; fuselage length, 32 ft. 10½ in.; overall height, 9 ft. 2¼ in.
Development: Flown for the first time on July 9, 1959, the SM 67 was the second German post-war helicopter of indigenous design, its development being initiated as a private venture by the Merckle Flugzeugwerke G.m.b.H. in 1956. Financial support was subsequently furnished by the German Defence Ministry, and two prototypes have been completed. The current Artouste IIB turbine is to be supplanted by the 493 e.h.p. Artouste IIC for further trials, and the proposed production model will carry four passengers in an enclosed cabin. Bonded light alloy rotor blades are employed, and these are unusual in having the drag and flapping hinges positioned some distance from the hub.



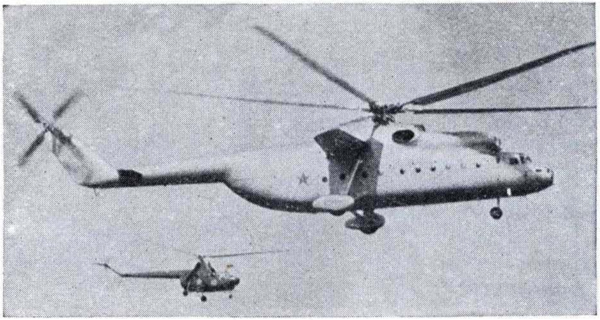
MIL MI-1 (HARE)

Country of Origin: U.S.S.R.
Type: Four-seat General-purpose Helicopter.
Power Plant: One Ivchenko AI-26V seven-cylinder radial air-cooled engine rated at 575 h.p.
Performance: Maximum speed, 124 m.p.h.; cruising speed, 87 m.p.h.; vertical climb rate, 1,280 ft./min. at sea level; hovering ceiling, 10,825 ft.; service ceiling, 14,760 ft.; normal range, 217 mls.
Weights: Empty, 3,925 lb.; loaded, 4,960 lb.
Dimensions: Rotor diameter, 45 ft. 11 in.; fuselage length, 39 ft. 8 in.; overall height, 10 ft. 10 in.
Development: The Mil Mi-1 has been in continuous production since 1950, the latest variant being known as the Moskvich, this having all-metal rotor blades and hydraulic controls. The Mi-1 is manufactured under licence in Poland as the SM-1, a five-seat development with an enlarged forward fuselage being designated S-2, and Russian production models include the multi-purpose Mi-1NKh (described by the specification), the Mi-1T three-seater, and the Mi-1U trainer model.



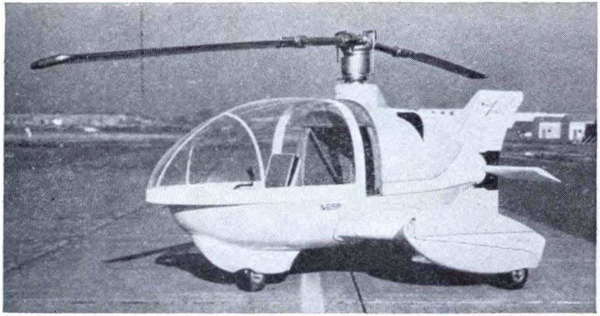
MIL MI-4 (HOUND)

Country of Origin: U.S.S.R.
Type: General-purpose and Transport Helicopter.
Power Plant: One Shvetsov ASh-82V fourteen-cylinder radial air-cooled engine rated at 1,700 h.p.
Performance: Maximum speed, 116 m.p.h. at 4,920 ft.; cruising speed, 93 m.p.h.; service ceiling, 16,000 ft.; range (11 passengers and 220 lb. baggage), 155 mls., (8 passengers and 220 lb. baggage), 250 mls.
Weights: Empty, 8,800 lb.; max. loaded, 15,873 lb.
Dimensions: Rotor diameter, 68 ft. 10¾ in.; fuselage length, 55 ft. 1 in.; overall height, 17 ft.
Development: The Mi-4 is manufactured under licence in China, and has been exported to many countries, including Austria, Belgium, Cuba, Italy, Switzerland, India, Indonesia, and the U.A.R. The military version normally has a ventral gondola for the navigator, and production commenced in 1952. Civil versions include the Mi-4P which carries 8–11 passengers, and the Mi-4S for agricultural duties. The latest model has a redesigned, stepped nose fairing and all-metal rotor blades. A turbine version is currently under test.



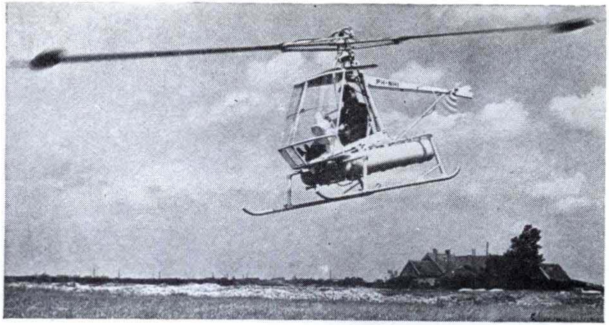
MIL MI-6 (HOOK)

Country of Origin: U.S.S.R.
Type: Heavy Transport Helicopter.
Power Plants: Two Soloviev TB-2BM free turbines each rated at 5,500 e.h.p. for five minutes and 4,400 e.h.p. normal maximum continuous rating.
Performance: Approximate maximum speed, 175 m.p.h.; normal range, 300 mls.; service ceiling (maximum payload), 13,500 ft.
Weights: Empty, 45,000 lb.; loaded, 71,000 lb.
Dimensions: Rotor diameter, 114 ft. 10 in.; approximate fuselage length, 122 ft. 6 in.; approximate overall height, 40 ft. 6 in.
Development: The world's largest helicopter, the Mi-6 was designed primarily to meet geological survey requirements in Siberia, these calling for the ability to lift a 24,000-lb. payload to an altitude of 12,000 ft. On April 16, 1959, an Mi-6 lifted 22,050 lb. to 16,045 ft., and 11,025 lb. to 18,045 ft., and on November 21, 1959, an Mi-1 established a new world helicopter speed record for the 100-km. closed circuit with an average speed of 167·206 m.p.h.



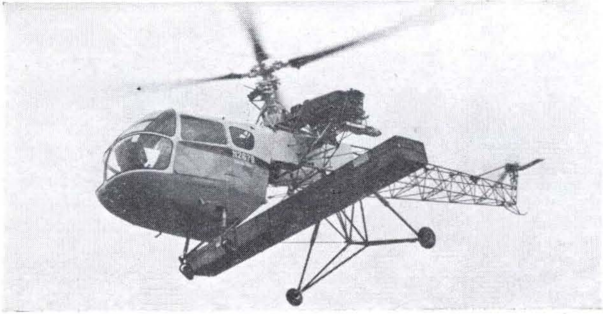
MONTE-COPTER 15 TRIPHIBIAN

Country of Origin: U.S.S.R.
Type: Three-seat Amphibious Helicopter.
Power Plant: One Continental 141 air compressor rated at 200 gas h.p.
Performance: Maximum speed, 95 m.p.h.; cruising speed, 75 m.p.h.; maximum inclined climb rate, 1,100 ft./min.; service ceiling, 15,000 ft.; normal range, 100 mls.; maximum range, 170 mls.
Weights: Empty, 1,232 lb.; loaded, 2,000 lb.
Dimensions: Rotor diameter, 36 ft.; fuselage length, 15 ft. 3 in.; overall height, 8 ft. 3 in.
Development: The Triphibian is of extremely simple design with "cold jet" rotor drive, compressed air being ejected from nozzles at the blade tips, and a glass-fibre boat-type hull. The rotor is off-loaded in forward flight by small delta wings, and the Triphibian can be taxied on land or water by means of jet thrust from the air compressor. Construction of the Triphibian began in June 1958, and prototype trials commenced in February 1960. The Monte-Copter 10 was fitted with two Continental 140 air compressors.



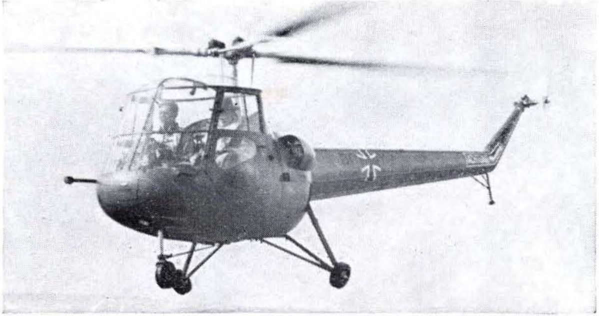
NHI H-3 KOLIBRIE

Country of Origin: Netherlands.
Type: Two-seat Light Utility Helicopter.
Power Plants: Two NHI TJ-5A ramjets each rated at 51 lb.s.t.
Performance: Maximum speed, 72 m.p.h.; cruising speed, 56–62 m.p.h.; maximum inclined climb rate, 680 ft./min.; hovering ceiling (in ground effect), 2,450 ft.; range (pilot only), 46 mls.
Weights: Empty, 560 lb.; max. loaded, 1,544 lb.
Dimensions: Rotor diameter, 32 ft. 8½ in.; fuselage length, 14 ft. 2½ in.; overall height, 9 ft. 0½ in.
Development: The Kolibrie (Humming Bird), developed by the Nederlandse Helicopter Industrie N.V., was flown for the first time in May 1956, but in May 1959, manufacture of the Kolibrie was taken over by the Aviolanda company after an initial series of ten helicopters had been completed. The initial model was powered by 44 lb.s.t. TJ-5 ramjets, but a second series of ten machines has the more powerful TJ-5As. The ramjet-driven rotor is of unique design, and is similar in principle to an automatic variable-pitch airscrew.



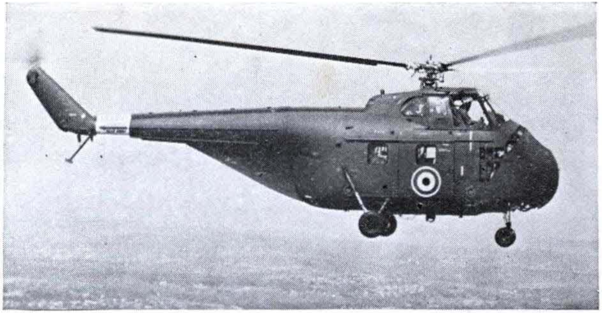
OMEGA BS-12D1

Country of Origin: U.S.A.
Type: Five-seat Utility Helicopter.
Power Plants: Two Lycoming O-540-F1B5 six-cylinder horizontally-opposed engines each rated at 260 h.p.
Performance: Maximum speed, 95 m.p.h. at sea level; economical cruising speed (65% power), 75 m.p.h.; maximum inclined climb rate, 1,200 ft./min.; hovering ceiling (in ground effect), 6,200 ft.
Weights: Empty, 3,350 lb.; loaded, 4,750 lb.
Dimensions: Rotor diameter, 39 ft.; fuselage length, 39 ft. 1 in.; overall height, 13 ft.
Development: The prototype Omega BS-12 flew for the first time on December 29, 1956, and accent has been placed on structural simplicity. The first production BS-12D1 was completed in August 1959, and twin and triple turbine-powered models (employing Allison T63-A-3 turbines) are under development. The BS-12E is being offered with 225 h.p. Franklin 6AS-335 supercharged engines, these engines having been installed in the first prototype. The triple-turbine model will have a 2,500-lb. payload.



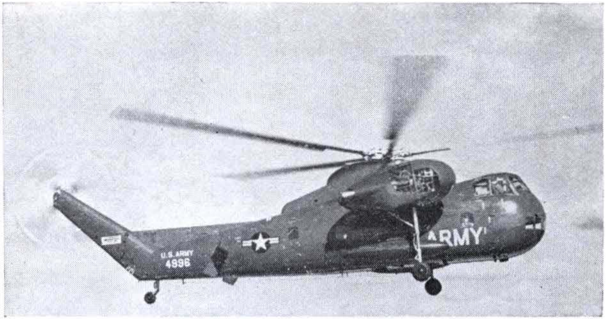
SAUNDERS-ROE SKEETER A.O.P.12

Country of Origin: Great Britain.
Type: Two-seat Air Observation Post Helicopter.
Power Plant: One de Havilland Gipsy Major 215 four-cylinder air-cooled engine rated at 215 h.p.
Performance: Maximum speed, 104 m.p.h.; maximum cruising speed, 101 m.p.h.; maximum inclined climb rate, 1,150 ft./min.; hovering ceiling (in ground effect), 5,500 ft.; maximum range, 213 mls.
Weights: Empty, 1,656 lb.; loaded, 2,300 lb.
Dimensions: Rotor diameter, 32 ft.; fuselage length, 26 ft. 6 in.; overall height, 7 ft. 6 in.
Development: Originally developed by the Cierva Autogiro Company, the Skeeter was taken over by Saunders-Roe in 1951, several versions being produced, the Series 6 (A.O.P.10 and T.11) with the 200 h.p. Gipsy Major 200, and the Series 7 (A.O.P.12) described above. The Skeeter Mks. 50 and 51, similar to the A.O.P.12, were respectively versions for the Federal German Army and Navy. Production of the Skeeter terminated in 1960, and one has been fitted with a Turmo 603 free-turbine.



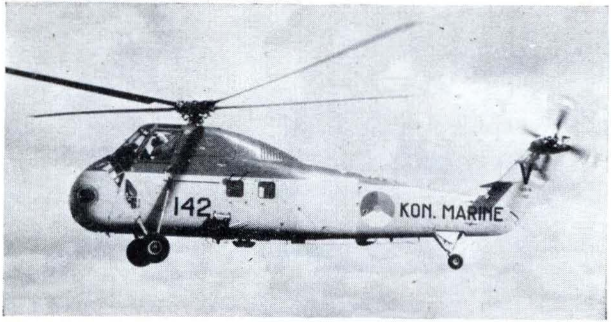
SIKORSKY H-19D CHICKASAW (S-55)

Country of Origin: U.S.A.
Type: Twelve-seat Utility Helicopter.
Power Plant: One Wright R-1300-3 seven-cylinder radial air-cooled engine rated at 700 h.p.
Performance: Maximum speed, 115 m.p.h. at sea level; cruising speed (65% power), 93 m.p.h.; inclined climb rate, 990 ft./min.; hovering ceiling (in ground effect), 8,600 ft.; range, 400 mls.
Weights: Empty, 5,045 lb.; loaded, 7,500 lb.
Dimensions: Rotor diameter, 53 ft.; fuselage length, 42 ft. 2 in.; overall height, 13 ft. 4 in.
Development: The S-55 helicopter was adopted by the U.S. Army Field Forces as the H-19C and D, by the U.S.A.F. as the H-19A and B, by the U.S. Navy as the HO4S-1 and -2, by the U.S. Coastguard as the HO4S-2G, and by the U.S. Marine Corps as the HRS-1, -2, and -3. Three commercial models were produced: the S-55 with the 600-h.p. Pratt and Whitney R-1340, the S-55A with the 700-h.p. Wright R-1300-3, and the S-55C which was similarly powered to the S-55 but featured the inclined S-55A tailboom.



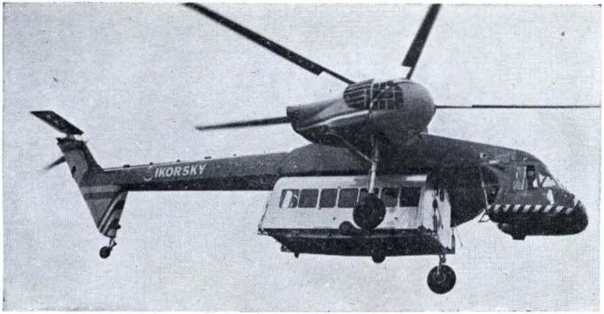
SIKORSKY H-37A MOJAVE (S-56)

Country of Origin: U.S.A.
Type: Heavy Transport Helicopter.
Power Plants: Two Pratt and Whitney R-2800-50 eighteen-cylinder radial engines each rated at 1,900 h.p.
Performance: Maximum speed, 130 m.p.h. at sea level; cruising speed, 115 m.p.h.; maximum climb rate, 990 ft./min.; hovering ceiling (out of ground effect), 1,100 ft.; service ceiling, 8,700 ft.
Weights: Empty, 20,690 lb.; normal loaded, 30,188 lb.; maximum loaded, 31,000 lb.
Dimensions: Rotor diameter, 72 ft.; fuselage length, 82 ft. 10 in.; overall height, 22 ft.
Development: The S-56 is employed as an assault transport by the U.S. Marine Corps under the designation HR2S-1, and by the U.S. Army as the H-37A Mojave. The Mojave will carry thirty-six fully-equipped troops, a 105-mm. howitzer and its crew, or three MM-100 jeep-type vehicles. There are clamshell doors in the nose, and vehicles can be driven up a ramp. A model with AN/APS-20E early warning radar is designated HR2S-1W.



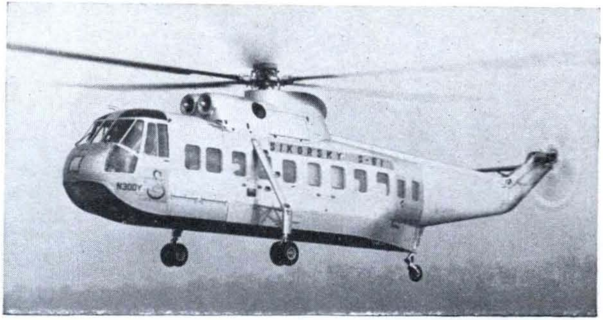
SIKORSKY H-34A CHOCTAW (S-58)

Country of Origin: U.S.A.
Type: Transport and General-purpose Helicopter.
Power Plant: One Wright R-1820-84 nine-cylinder air-cooled radial rated at 1,525 h.p.
Performance: Maximum speed, 134 m.p.h. at sea level; cruising speed (67% power), 101 m.p.h.; initial climb rate, 1,075 ft./min.; hovering ceiling (with ground effect), 4,000 ft.; normal range, 225 mls.
Weights: Empty, 7,560 lb.; loaded, 12,700 lb.
Dimensions: Rotor diameter, 56 ft.; fuselage length, 46 ft. 9 in.; overall height, 15 ft. 10 in.
Development: The H-34A Choctaw is the U.S. Army version of the S-58, and is employed as a sixteen-seat transport. In its general-purpose form as used by the U.S. Marine Corps it is designated HUS-1, and U.S. Navy versions include the HSS-1 and HSS-1N, the latter using automatic stabilisation equipment. One HSS-1 helicopter was fitted with a General Electric T-58 shaft turbine as a prototype for the HSS-2. The photograph depicts an S-58 helicopter of the Dutch Navy.



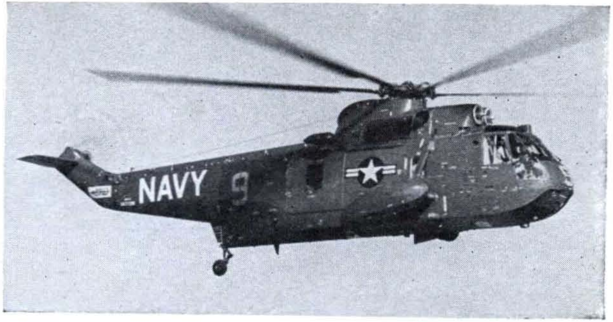
SIKORSKY S-60 SKYCRANE

Country of Origin: U.S.A.
Type: Three-seat Crane Helicopter.
Power Plants: Two Pratt and Whitney R-2800-50 eighteen-cylinder radials each rated at 2,100 h.p.
Performance: Maximum speed (without load), 130 m.p.h. at sea level; economical cruising speed, 115 m.p.h. at 2,000 ft.; range, 265 mls., (with 6,000-lb. payload), 100 mls., (with maximum payload), 23 mls.; maximum climb rate, 1,100 ft./min.; hovering ceiling (in ground effect), 6,800 ft.; service ceiling, 10,800 ft.
Weights: Empty, 19,613 lb.; normal loaded, 31,200 lb.; maximum, 34,500 lb.
Dimensions: Rotor diameter, 72 ft.; fuselage length, 65 ft.; overall height, 21 ft. 8 in.
Development: A piston-engined predecessor of a twin-turbine-powered crane designated S-64, the Skycrane employs the rotors, transmission and power plants of the S-56, and is essentially a structural body for carrying crew, engines, rotors and hoists. The accompanying photograph of the Skycrane shows a detachable passenger pod.



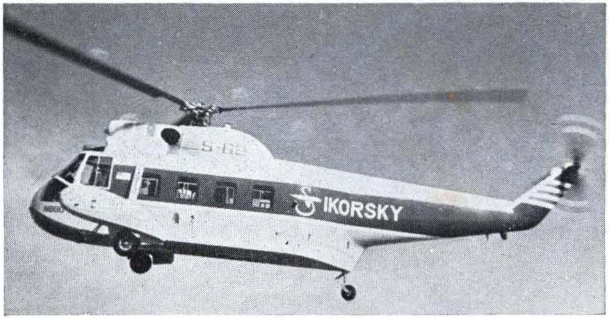
SIKORSKY S-61L

Country of Origin: U.S.A.
Type: Twenty-eight-passenger Transport Helicopter.
Power Plants: Two General Electric T58-GE-8 shaft turbines each rated at 1,250 s.h.p.
Performance: Maximum speed, 147 m.p.h. at sea level; cruising speed, 136 m.p.h.; maximum inclined climb rate, 1,600 ft./min.; hovering ceiling (in ground effect), 7,000 ft.; range, 350 mls.
Weights: Empty, 9,270 lb.; loaded, 18,700 lb.
Dimensions: Rotor diameter, 62 ft.; fuselage length, 58 ft. 11 in.; overall height, 15 ft. 4 in.
Development: Flown for the first time in December 1960, the S-61L is shortly to enter airline service with Chicago Helicopter Airways and Los Angeles Airways, four having been ordered by the former and five by the latter concern. Unlike the U.S. Navy's S-61 (HSS-2), the S-61L does not possess an amphibious hull, being limited to land operations. Licences for the manufacture of the S-61 have been acquired by Mitsubishi in Japan and by Weser Flugzeugbau (S-61D) in Germany.



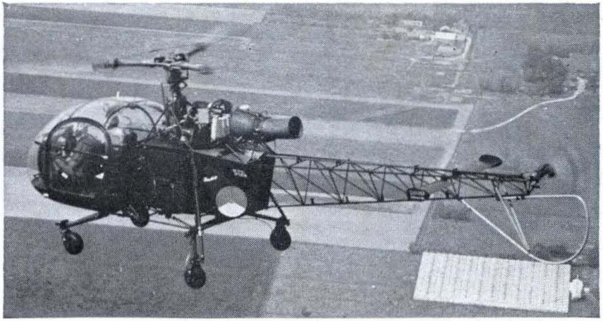
SIKORSKY HSS-2 (S-61)

Country of Origin: U.S.A.
Type: Amphibious Anti-submarine Warfare Helicopter.
Power Plants: Two General Electric T58-GE-8 shaft turbines each rated at 1,250 s.h.p.
Performance: Maximum speed, 186 m.p.h. at 6,000 ft.; maximum cruising speed, 151 m.p.h.; maximum climb rate, 1,620 ft./min.; vertical climb rate, 720 ft./min.; hovering ceiling (out of ground effect), 10,800 ft.
Weights: Empty, 9,953 lb.; normal loaded, 17,300 lb.
Dimensions: Rotor diameter, 62 ft.; fuselage length, 54 ft. 9 in.; overall height, 15 ft. 4 in.
Development: Several variants of the S-61 helicopter are in production, the first of which, the HSS-2 for the U.S. Navy, was flown for the first time in March 1959. An assault transport version, the S-61C, has been developed for the U.S. Marine Corps as the HR3S-1. Capable of carrying 20–25 fully-equipped troops, the HR3S-1 features a rear-loading ramp. This version is generally similar to that which it is proposed should be built in Germany as the S-61D.



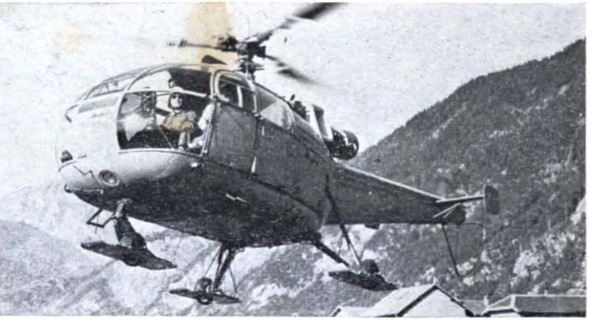
SIKORSKY S-62

Country of Origin: U.S.A.
Type: Amphibious Commercial Transport Helicopter.
Power Plant: One General Electric T58-GE-6 shaft turbine rated at 1,050 s.h.p.
Performance: Maximum speed, 124 m.p.h. at sea level; maximum cruising speed, 115 m.p.h. at 1,000 ft.; maximum climb rate, 1,380 ft./min.; vertical climb rate, 450 ft./min.; hovering ceiling (out of ground effect), 8,000 ft.; service ceiling, 15,700 ft.; range (full payload and 10% reserves), 270 mls.
Weights: Empty, 4,550 lb.; loaded, 7,500 lb.
Dimensions: Rotor diameter, 53 ft.; fuselage length, 44 ft. 7 in.; overall height, 14 ft. 2 in.
Development: Flown for the first time in May 1958, the S-62 employs many of the well-proven components of the S-55, although possessing an entirely new power system and a new hull design for amphibious operation. The first commercial operator to order the S-62 was Los Angeles Airways, and in airline use the helicopter will carry up to ten passengers with provision for a crew of two.



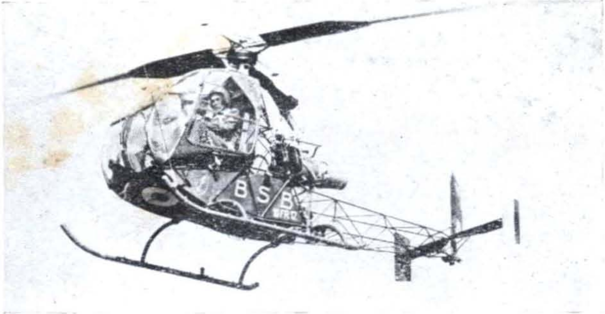
SUD-AVIATION SE-3130 ALOUETTE II

Country of Origin: France.
Type: Five-seat General-purpose Helicopter.
Power Plant: One Turboméca Artouste II shaft turbine rated at 400 s.h.p.
Performance: Maximum speed, 109 m.p.h. at sea level; cruising speed, 106 m.p.h.; hovering ceiling (in ground effect), 6,560 ft.; maximum inclined climb rate, 880 ft./min.; range, 330 mls.
Weights: Empty, 1,875 lb.; max. loaded, 3,527 lb.
Dimensions: Rotor diameter, 33 ft. 6 in.; fuselage length, 31 ft. 10 in.; overall height, 9 ft.
Development: The Alouette II, of which 740 examples had been ordered by mid-1961, 363 of these being for export, flew for the first time on March 12, 1955, and the type is assembled in Sweden by SAAB, and in the U.S.A. by Republic Aviation. The military version has completed firing trials with six SS.11 anti-tank missiles mounted on booms attached to the cabin sides. The Alouette II has been supplied to foreign civil and military operators in some twenty-five countries, and is being produced at a rate of sixteen per month.



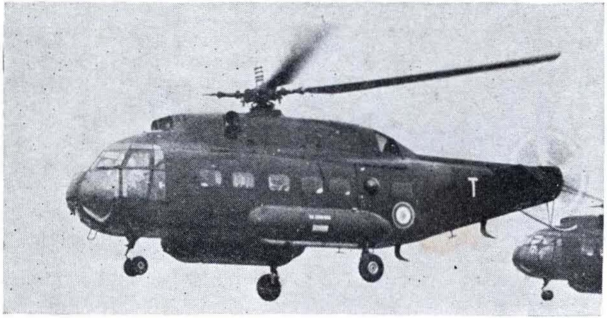
SUD-AVIATION SE-3160 ALOUETTE III

Country of Origin: France.
Type: Seven-seat General-purpose Helicopter.
Power Plant: One Turboméca Artouste IIIB turbine derated to 450 s.h.p.
Performance: Maximum cruising speed (at 4,190 lb.), 124 m.p.h. at sea level; economical cruising speed, 111 m.p.h.; hovering ceiling, 9,840 ft.; service ceiling, 13,100 ft.; maximum ceiling, 19,650 ft.; range (1,540-lb. payload), 62 mls., (1,190-lb. payload), 186 mls.; maximum range, 334 mls. at 95 m.p.h.
Weights: Empty, 2,300 lb.; normal loaded, 4,190 lb.; maximum loaded, 4,630 lb.
Development: The SE-3160 Alouette III has been derived from the highly successful SE-3130 Alouette II, 500 of which are being built at a rate of six per month, and which is being employed in twenty-one different countries. The Alouette III, which was first flown in March 1959, differs from its predecessor in having a reinforced transmission system, an enlarged and cleaned up fuselage, and an Artouste IIIB turbine. This helicopter has been ordered by South Africa.



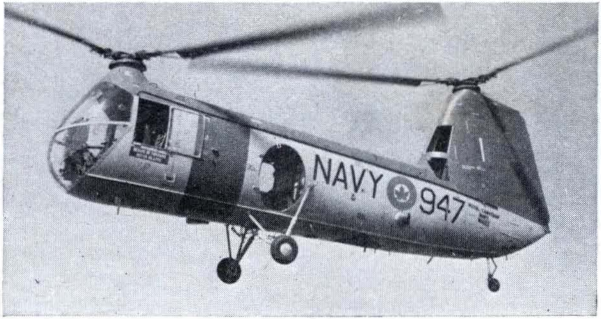
SUD-AVIATION SO-1221 DJINN

Country of Origin: France.
Type: Two-seat General-purpose Helicopter.
Power Plant: One Turboméca Palouste IV air compressor rated at 240 e.h.p.
Performance: Maximum speed, 81 m.p.h.; cruising speed, 62 m.p.h.; maximum inclined climb rate, 690 ft./min.; hovering ceiling (in ground effect), 5,900 ft.; normal range, 118 mls.; ferry range, 200 mls.
Weights: Empty, 794 lb.; loaded, 1,764 lb.
Dimensions: Rotor diameter, 36 ft.; fuselage length, 17 ft. 5 in.; overall height, 8 ft. 5 in.
Development: The world's first tip jet helicopter, the Djinn was flown for the first time on December 16, 1953. One hundred and fifty Djinns were ordered, 100 being delivered to France's A.L.A.T., three being supplied to the U.S. Army for evaluation as the YHO-1DJ, six being supplied to the German Defence Ministry, and others to civilian operators. The Djinn's rotor is driven by compressed air supplied by the turbo-generator, and there are no combustion chambers at the rotor blade tips.



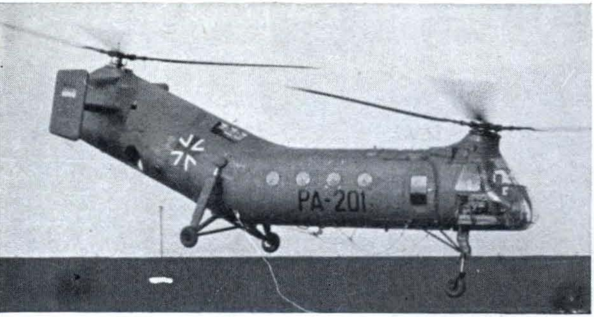
SUD-AVIATION SE-3200 FRELON

Country of Origin: France.
Type: Heavy Transport and Anti-submarine Warfare Helicopter.
Power Plants: Three Turboméca Turmo IIIB free turbines each rated at 750 s.h.p.
Performance: Maximum speed, 153 m.p.h.; cruising speed, 144 m.p.h.; ceiling (at 15,400 lb.), 12,450 ft.; maximum range, 620 mls.
Weights: Empty, 9,920 lb.; normal loaded, 16,550 lb.; maximum, 17,600 lb.
Dimensions: Rotor diameter, 49 ft. 1½ in.; fuselage length, 48 ft. 10½ in.; overall height, 15 ft. 5 in.
Development: The Frelon is a multi-purpose helicopter capable of undertaking the rôles of troop transport (24 fully-equipped troops), casualty evacuation (15 casualty litters and two attendants), anti-submarine warfare, and mine-sweeping. The first of two prototypes was flown on June 10, 1959, and the proposed production model will be powered by 1,000–1,100 s.h.p. Turmo IIIC turbines. During its test programme, the Frelon has flown at 17,150 lb. weight.



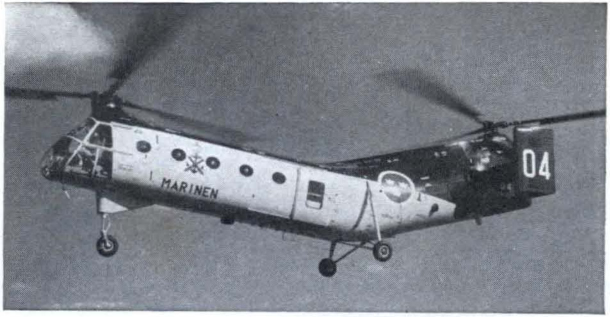
VERTOL HUP-3 RETRIEVER

Country of Origin: U.S.A.
Type: Medical Evacuation and Light Cargo Helicopter.
Power Plant: One Continental R-975-46 radial air-cooled engine rated at 550 h.p.
Performance: Maximum speed, 108 m.p.h. at sea level; cruising speed, 82 m.p.h.; maximum inclined climb rate, 980 ft./min.; hovering ceiling (in ground effect), 7,000 ft.; normal range, 490 mls.
Weights: Empty, 3,928 lb.; max. loaded, 6,100 lb.
Dimensions: Rotor diameter, 35 ft.; fuselage length, 32 ft.; overall height, 12 ft. 6 in.
Development: Designed to meet U.S. Navy requirements as the XHJP-1, the Retriever has been built in several versions, these being HUP-1 with a 525 h.p. R-975-34 engine, production deliveries of which commenced in 1950; the HUP-2 with the up-rated R-975-46 engine, automatic controls and the vertical auxiliary tail surfaces eliminated; the HUP-3 described above, and the HUP-4, a retrofit of the -3 with an 800 h.p. Wright R-1300-13 engine. The U.S. Army version of the HUP-3 is designated H-25A Army Mule.



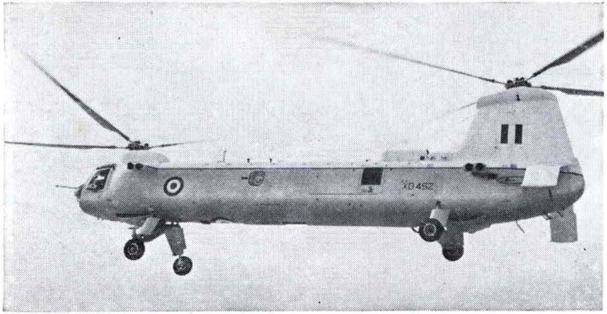
VERTOL H-21C WORK HORSE

Country of Origin: U.S.A.
Type: Assault Transport Helicopter.
Power Plant: One Wright R-1820-103 Cyclone radial air-cooled engine rated at 1,425 h.p.
Performance: Maximum speed, 130 m.p.h. at sea level; cruising speed, 98 m.p.h.; maximum inclined climb rate, 1,080 ft./min.; hovering ceiling (in ground effect), 6,100 ft.; service ceiling, 9,450 ft.
Weights: Empty, 8,800 lb.; normal loaded, 13,500 lb.
Dimensions: Rotor diameter (each), 44 ft.; fuselage length, 52 ft. 6 in.; overall height, 15 ft. 5 in.
Development: The Vertol Model 43 has been produced in several versions for the U.S.A.F., the U.S. Army, the Armée de l'Air, the R.C.A.F., and the German Army. The initial production model, the H-21A, was an Arctic rescue helicopter, but the H-21B and H-21C Shawnee are troop and cargo transports. Twelve casualty stretchers or twenty troops may be accommodated. The designation H-21D was applied to two experimental machines each fitted with two General Electric T58 turbines.



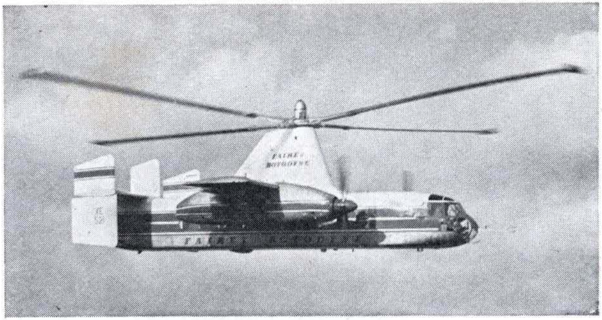
VERTOL 44

Country of Origin: U.S.A.
Type: General-purpose Transport Helicopter.
Power Plant: One Wright R-1820-103 Cyclone radial air-cooled engine rated at 1,425 h.p.
Performance: Maximum speed, 127 m.p.h. at sea level; cruising speed, 101 m.p.h.; maximum inclined climb rate, 1,050 ft./min.; hovering ceiling (in ground effect), 5,000 ft.; service ceiling, 10,600 ft.
Weights: Empty, 8,655 lb.; maximum loaded, 15,000 lb.
Dimensions: Rotor diameter (each), 44 ft.; fuselage length, 52 ft. 6 in.; overall height, 15 ft. 5 in.
Development: An improved version of the Model 43, the Model 44 is available in both civil and military versions. Four have been supplied to the Swedish Navy for anti-submarine duties (one of these being illustrated), and two Model 44Bs have been acquired by the French government. Current models include the Model 44A utility passenger/cargo transport with accommodation for nineteen passengers; the Model 44B fifteen-passenger transport, and the Model 44C executive transport with custom-designed interior.



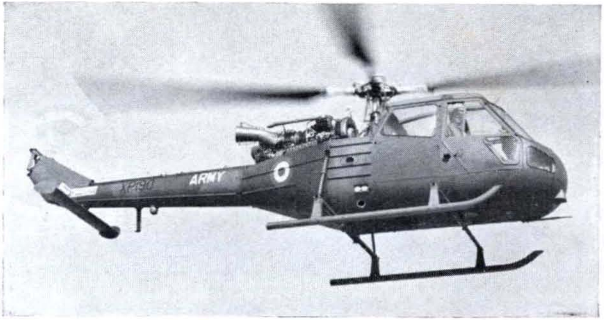
WESTLAND BELVEDERE

Country of Origin: Great Britain.
Type: General-purpose and Transport Helicopter.
Power Plants: Two Napier Gazelle 100 (N.Ga.2) free turbines each rated at 1,650 s.h.p.
Performance: Maximum cruising speed, 138 m.p.h.; economic cruising speed, 115 m.p.h.; maximum climb rate, 1,200 ft./min.; vertical climb rate, 385 ft./min.; hovering ceiling (in ground effect), 7,500 ft.; maximum range (standard tankage), 460 mls., (with auxiliary tankage), 783 mls.
Weights: Empty, 11,085 lb.; normal loaded, 18,500 lb.; overload, 20,000 lb.
Dimensions: Rotor diameter (each), 48 ft. 11 in.; fuselage length, 54 ft. 4 in.; overall height, 17 ft. 3 in.
Development: Previously known as the Bristol 192, the Belvedere was flown for the first time on July 5, 1958, and the first three of an order for thirty for the R.A.F. were delivered in September 1960. As a troop transport, the Belvedere can accommodate nineteen fully-equipped troops. A 23-passenger inter-city commercial model is proposed.



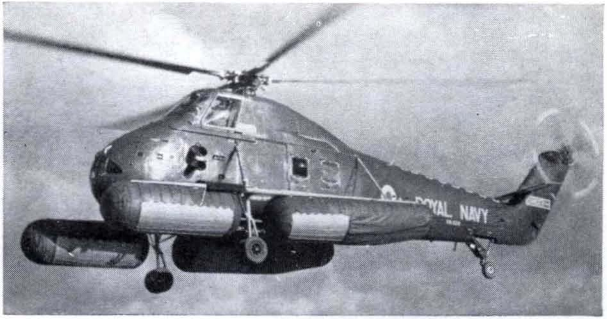
WESTLAND ROTODYNE "Y"

Country of Origin: Great Britain.
Type: Vertical Take-off and Landing Transport (65 passengers).
Power Plants: Two Rolls-Royce Tyne two-spool turboprops each rated at 5,250 s.h.p.
Performance: Cruising speed, 200–230 m.p.h. at 5,000 ft.; maximum range, 700 mls. at 200 m.p.h.; vertical climb rate, 2,150 ft./min.; hovering ceiling, 9,000 ft.
Weights: Empty, 35,000 lb.; normal loaded, 53,500 lb.; maximum, 60,000 lb.
Dimensions: Rotor diameter, 109 ft.; wing span, 75 ft.; fuselage length, 69 ft. 5 in.; overall height, 27 ft. 3 in.
Development: The Rotodyne is unique in combining the attributes of a fixed-wing airliner and helicopter, and the Fairey-built Rotodyne "Y" prototype (illustrated) powered by 3,000 e.h.p. Napier Eland N.El.3 turboprops had made over 300 flights by the end of 1960 when detail design of the larger, Tyne-powered production model (to which the above specification relates) was well advanced.



WESTLAND P.531-2 SCOUT

Country of Origin: Great Britain.
Type: Five/six-seat Light Utility Helicopter.
Power Plant: One Blackburn A.129 Nimbus free turbine engine derated to 650 s.h.p.
Performance: Maximum speed, 127 m.p.h.; maximum cruising speed, 121 m.p.h.; maximum climb rate, 1,490 ft./min.; vertical climb rate, 600 ft./min.; hovering ceiling (in ground effect), 17,800 ft.; maximum range (pilot and three passengers plus 10% reserves), 250 mls.
Weights: Empty, 2,836 lb.; normal loaded, 5,000 lb.
Dimensions: Rotor diameter, 32 ft. 3 in.; fuselage length, 30 ft. 10 in.; height, 8 ft. 10 in.
Development: The Scout and the Wasp are respectively civil and military versions of the original Saunders-Roe P.531 which first flew on July 20, 1958. The Wasp differs primarily in having a de Havilland Gnome derated to 650 s.h.p., and the details given above are equally applicable to both types. A contract for the development of the Nimbus-powered Scout was awarded during 1960.



WESTLAND WESSEX H.A.S.1

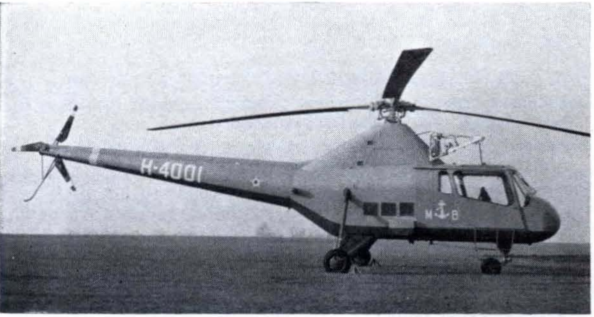
Country of Origin: Great Britain.
Type: Anti-submarine Warfare Helicopter.
Power Plant: One Napier Gazelle 160 (N.Ga.13) free turbine rated at 1,450 s.h.p.
Performance: Maximum speed, 132 m.p.h.; maximum cruising speed, 127 m.p.h.; economic cruising speed, 115 m.p.h.; maximum climb rate, 1,750 ft./min.; vertical climb rate, 750 ft./min.; hovering ceiling, 7,000 ft.; service ceiling, 14,200 ft.; maximum range, 390 mls.
Weights: Empty, 7,600 lb.; loaded, 12,600 lb.
Dimensions: Rotor diameter, 56 ft.; fuselage length, 49 ft. 11 in.; overall height, 14 ft. 3 in.
Development: Currently entering service with the Royal Navy for submarine detection and strike, the Wessex has been derived from the Sikorsky S-58, and the first prototype machine was flown on June 20, 1958. A Mk. 2 Wessex powered by two 1,250 s.h.p. de Havilland Gnome H.1200 free turbines is under development. This variant will carry sixteen troops as a military transport, as will also the H.A.S.1.

WESTLAND WHIRLWIND SERIES 2

Country of Origin: Great Britain.
Type: Ten-seat General-purpose Helicopter.
Power Plant: One Alvis Leonides Major 755 radial air-cooled engine rated at 750 h.p.
Performance: Maximum speed, 109 m.p.h. at sea level; cruising speed. 86 m.p.h.; maximum inclined climb rate, 1,080 ft./min.; hovering ceiling (in ground effect), 5,500 ft.; range, 355 mls.
Weights: Empty, 5,580 lb.; loaded, 7,800 lb.
Dimensions: Rotor diameter, 53 ft.; fuselage length, 41 ft. 8½ in.; overall height, 13 ft. 4 in.
Development: The Whirlwind is an extensively developed version of the Sikorsky S-55 (see page 157), and several models have been built. These include the H.A.R.1 and 2 powered by the Pratt and Whitney R-1340-40 for the Royal Navy and R.A.F. respectively; the H.A.R.3 with the Wright R-1300-3 for the Royal Navy; the H.A.R.4 (R-1340-57) for the R.A.F.; the H.A.R.5 (Leonides Major 155) for the Royal Navy and Army; the similarly-powered H.A.S.7 anti-submarine helicopter, and the H.C.C.8 for The Queen's Flight.

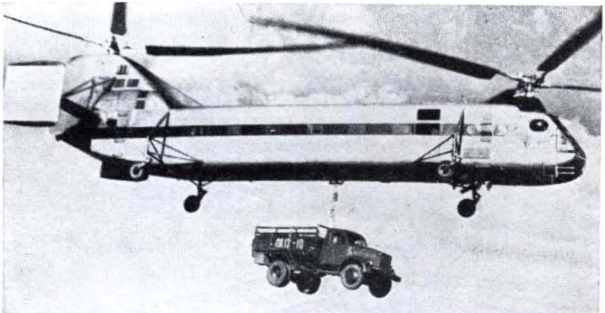
WESTLAND WHIRLWIND SERIES 3

Country of Origin: Great Britain.
Type: Ten-seat General-purpose Helicopter.
Power Plant: One de Havilland Gnome H.1000 free turbine rated at 1,050 s.h.p.
Performance: Maximum speed, 109 m.p.h.; maximum economical cruising speed, 104 m.p.h.; maximum climb rate, 1,200 ft./min.; hovering ceiling, 14,500 ft.; service ceiling, 15,200 ft.
Weights: Empty, 4,694 lb.; normal loaded, 8,000 lb.
Dimensions: Rotor diameter, 53 ft.; fuselage length, 44 ft. 2 in.; overall height, 15 ft. 7½ in.
Development: Derived from the piston-engined Whirlwind (a licence-built development of the Sikorsky S-55), the Gnome-powered Srs. 3 Whirlwind flew for the first time on February 28, 1959, and has been ordered into production for the R.A.F. as the Whirlwind H.A.R.10. The R.A.F. also proposes to convert its piston-engined Whirlwinds to H.A.R.10 standards. The third Gnome-powered machine is truly representative of the H.A.R.10. As a freighter it can carry up to 2,000 lb. of freight.



WESTLAND WIDGEON

Country of Origin: Great Britain.
Type: Five-seat General-purpose Helicopter.
Power Plant: One Alvis Leonides 521/2 nine-cylinder radial air-cooled engine rated at 500 h.p.
Performance: Maximum speed, 104 m.p.h. at sea level; cruising speed, 81 m.p.h.; maximum inclined climb rate, 700 ft./min.; hovering ceiling (in ground effect), 5,000 ft.; maximum range, 310 mls.
Weights: Empty, 4,424 lb.; loaded, 5,900 lb.
Dimensions: Rotor diameter, 49 ft. 2 in.; fuselage length, 40 ft. 10 in.; overall height, 13 ft. 2¾ in.
Development: The Widgeon is a development of the Dragonfly which, in turn, was a licence-built version of the Sikorsky S-51. The Widgeon possesses an entirely new forward fuselage and the rotor head is of the type fitted to the larger Whirlwind, incorporating offset flapping hinges which give improved mechanical qualities and a greater c.g. range. Production Widgeons have been delivered to the Brazilian Navy (illustrated), the Royal Jordanian Air Force, and the Hong Kong government.

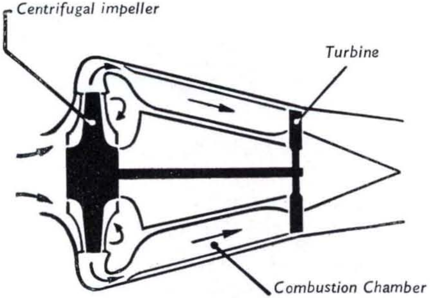


YAKOVLEV YAK-24 (HORSE)

Country of Origin: U.S.S.R.
Type: Military and Commercial Heavy Transport Helicopter.
Power Plants: Two Shvetsov ASh-82V fourteen-cylinder air-cooled radials each rated at 1,700 h.p.
Performance: Maximum speed, 138 m.p.h.; cruising speed, 112 m.p.h.; hovering ceiling (with ground effect) at 35,274 lb., 13,450 ft.; range (at 35,274 lb.), 155 mls., (at 38,590 lb.), 351 mls.; maximum range, 1,056 mls.
Weights: Normal loaded, 35,274 lb.; maximum loaded, 38,590 lb.
Dimensions: Rotor diameter (each), 65 ft. 7½ in.; approximate fuselage length, 80 ft.; approximate overall height, 21 ft.
Development: The Yak-24 entered production for the Soviet Air Forces in 1954, the initial production model being capable of accommodating forty troops, eighteen casualty litters or three M-20 Pobyeda staff cars. Several commercial models have been developed, the latest being the Yak-24K.

Afterburner. Jet-pipe extension downstream of a gas-turbine engine in which extra fuel can be burnt to increase thrust. Afterburning is also known as reheat.

Air-bleed gas turbine. Gas-turbine engine with an oversize compressor from which compressed air is tapped; engine power output is supplied in this way with little residual thrust, although in some versions shaft power is also given by the engine.



CENTRIFUGAL TURBOJET

Air-cooled engine. Either air or a liquid coolant is used to cool piston engines. All radial piston engines and some in-line ones are air-cooled.

Air intake. Open-ended forward-facing duct through which air is led to engines.

Annular. Ring-shaped. Used to describe components between inner and outer cylindrical shapes. Examples are annular air intakes, as on turboprops, and annular combustion systems.

Atomiser. Spray nozzle which converts fuel under pressure into a fine spray to ensure good dispersion and combustion.

Axial-flow compressor. Compressor in which airflow is in the direction of the axis. Such compressors have alternate rows of fixed (stator) and rotating blades. Each row of rotating blades is known as a compressor stage. If the compressor is divided into independent low-pressure and high-pressure sections, it is known as a two-spool compressor.

Axial-flow turbine. A turbine through which the gas flow is parallel to the axis of the engine.

Bi-propellant rocket. Rocket motor which relies on the combustion of a fuel and an oxidant to produce thrust.

Boost pressure. Pressure in the induction system of a piston engine, usually expressed in p.s.i. above or below standard sea-level atmospheric pressure.

Bore. Internal diameter of a piston-engine cylinder.

Boundary-layer bleed. Duct for leading away the slow-moving air at the fuselage edge of a side-mounted engine air intake to improve intake efficiency.

Brake horse power. Horse power provided at the propeller-shaft of a turboprop or piston engine, as measured by a brake.

Buried engine. Powerplant installed inside the main structure of an aircraft, usually in the fuselage or wing root.

Bypass engine. Jet engine of the turbofan type. It has a relatively large low-pressure compressor, and part of the air from this by-passes the high-pressure compressor, combustion system and turbines. Rolls-Royce built the first production by-pass engine and the name is associated with their engines of this type which have, in general, a lower by-pass ratio than other turbofans.

Centrifugal compressor. Compressor in which a rotating impeller flings air outwards centrifugally to produce pressure rise. Now outmoded by axial compressor, except for small engines, because of its inferior pressure ratio.

Combustion chamber. Chamber in which fuel is burnt in a turbine or rocket engine. It may be of the can type, annular or a combination of the two which is known as cannular. In a cannular system individual flame tubes are mounted in an annular chamber.

Compression ratio. Ratio of the volumes of the fuel-air mixture in a piston-engine cylinder before and after compression.

Compressor blades. Aerofoil section blades used in an axial compressor. Rotor blades are attached to revolving rotor;

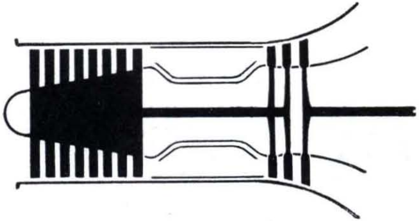
fixed stator blades are mounted between each row, or stage, of compressor blades; they are attached to the compressor casing.

Compressor bleed. Air under pressure taken from an engine compressor, usually to provide pneumatic power or high-pressure air for pressurisation, for flap-blowing or for control jets on a V.T.O.L. aircraft.

Diffusers. Sections in a turbine engine where a gradual increase in the cross-sectional area of flow is used to decelerate it and connect its kinetic energy to pressure energy.

Ducted-fan engine. See turbofan engine.

Exhaust cone. Conical assembly at the rear of a turbine engine which leads the annular exhaust flow from the turbine to the jetpipe.



FREE-TURBINE TURBOSHAFT

Equivalent shaft horse power. Shaft horse power of a turboprop engine plus an additional power allowance to allow for the residual jet thrust of the engine.

Free turbine. Turbine which is not mechanically connected to the rest of a gas turbine engine. Used to produce shaft power output in certain turboprop and turboshaft engines.

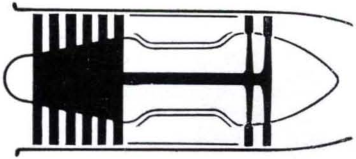
Flame tube. Tube in which gas-turbine fuel is burnt. Excess air is supplied to it for cooling.

Fuel injection. Injection of fuel straight into the cylinders of a piston engine rather than mixing it with air in a carburettor.

Gas-turbine engine. Engine in which air is compressed, heated by the combustion of a fuel and expanded through a turbine. Turbojet, turboprop and turboshaft engines are types of gas-turbine engine.

High-temperature alloys. Alloys which maintain good strength, creep and corrosion-resistance properties at high temperature. Examples are the Nimonic range of nickel alloys which are widely used in gas-turbine engines.

Horizontally-opposed engine. A piston engine which has its cylinders in pairs opposite each other with the crankcase between them.



SINGLE-SHAFT AXIAL-FLOW TURBOJET

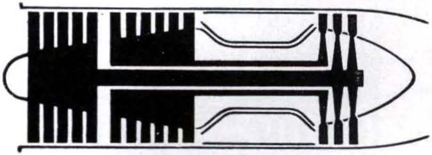
Impeller. The rotating part of a centrifugal compressor.

Inverted engine. Piston engine mounted with its cylinders below the crankshaft.

Jet deflection. Deflection of the efflux from a jet engine, usually to provide either a lifting thrust or a lift component in addition to propulsion thrust.

Jet engine. Gas-turbine engine which produces thrust by means of an exhaust jet of hot gas.

Jet lift. Use of turbojet thrust to provide vertical lift for an aircraft. Special jet-lift turbojets have been developed.



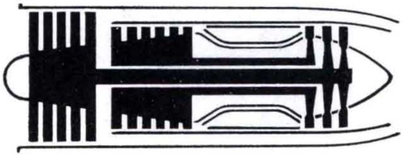
TWO-SPOOL TURBOJET

Jetpipe. Pipe leading the exhaust gases from a turbine engine to its propelling nozzle. Also known as tailpipe.

Kerosene. Name given to the paraffin-type fuels used in gas turbines.

Lift engine. Turbojet or turbofan engine which provides vertical thrust to support an aircraft but does not contribute to its propulsion.

Lift/thrust engine. Turbofan engine which uses jet deflection to provide lift thrust or propulsive thrust or combinations of both. Bristol Siddeley BS.53 is only current engine basically designed for this rôle.



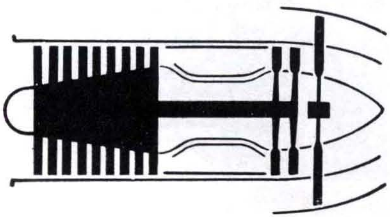
FRONT-FAN TURBOFAN (BY-PASS)

Liquid-cooled engine. Piston engine which relies on a liquid coolant for cooling (as opposed to an air-cooled engine).

Mass flow. Air consumption of a turbine engine, usually given in lb./sec.

Mixed powerplant. Combination of two types of powerplant in an aircraft, such as a turbojet and a rocket engine.

Monopropellant rocket. Rocket motor using a single propellant which is decomposed to provide propulsive gas stream.



FREE-TURBINE REAR-FAN TURBOFAN

Oxidant. Chemical carried to provide oxygen for combination with fuel in rocket motors; these do not use atmospheric oxygen for combustion of fuel as do turbine engines.

Podded engine. Turbine engine which is attached to the side of an aircraft's fuselage or under its wing by a streamlined strut; the engine is surrounded by a streamlined fairing.

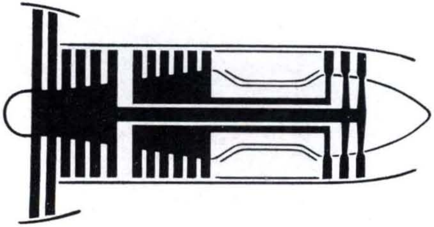
Power loading. Maximum take-off weight of an aircraft divided by the thrust or the power of its engines; expressed in lb./b.h.p. or lb./lb. of thrust.

Propellant. A propelling agent; a general term covering rocket-motor fuels and oxidants of all types.

Propeller turbine. See turboprop engine.

Prop-jet engine. See turboprop engine.

Propelling nozzle. Nozzle at the rear end of a turbojet jet-pipe. A variable-area nozzle is sometimes used to obtain the best thrust from the engine for both the take-off and for cruising flight. A variable nozzle is always necessary for afterburning.



TWO-SPOOL FRONT-FAN TURBOFAN

Ram pressure. Air pressure in the intake of a turbine or ram-jet engine produced by forward speed of an aircraft.

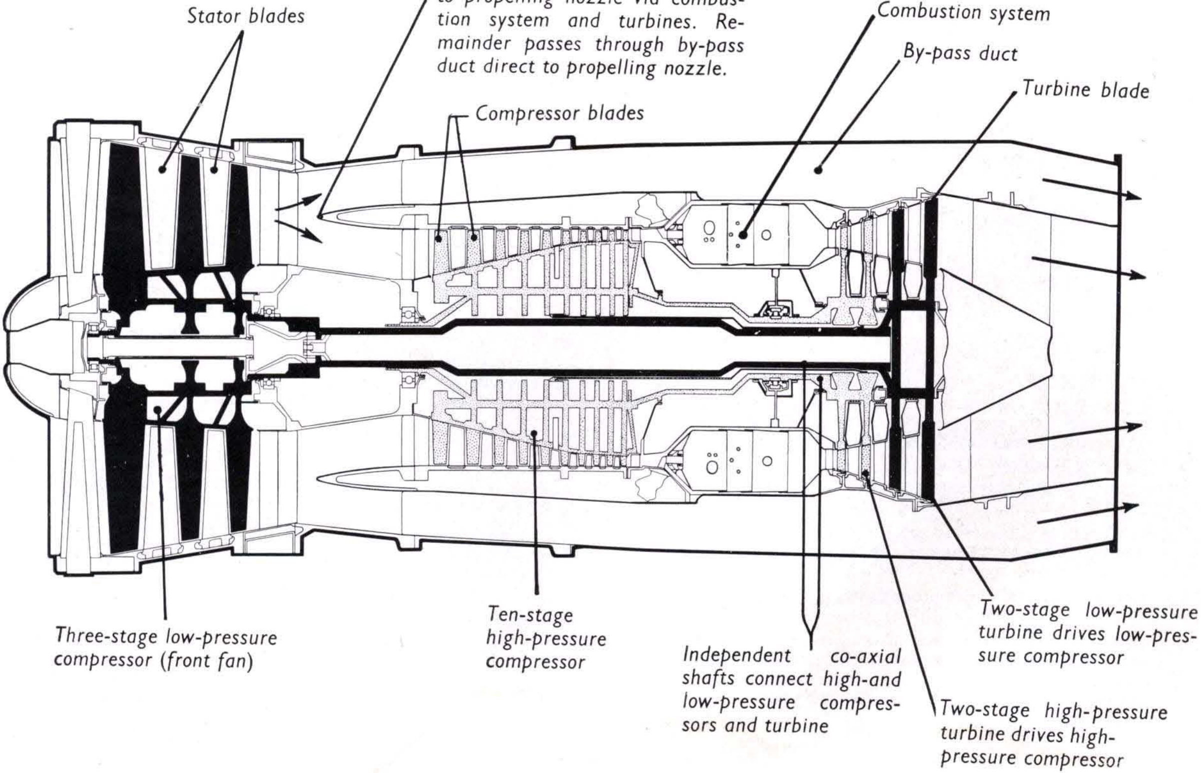
Ramjet engine. Air-breathing engine in which ram effect provides high-pressure air into which fuel is injected, burnt and a heated jet is expelled from the rear. It is, in effect, a turbojet engine without a compressor and turbine. Ramjets produce no thrust until travelling at high speed and only become efficient at speeds above Mach 2.

Reduction gear. Gearing used to reduce shaft speed. In piston and turboprop engines reduction gearing is used to drive the propeller shaft.

Reheat. Burning of fuel downstream of a turbojet-engine turbine to increase thrust. Same as afterburning.

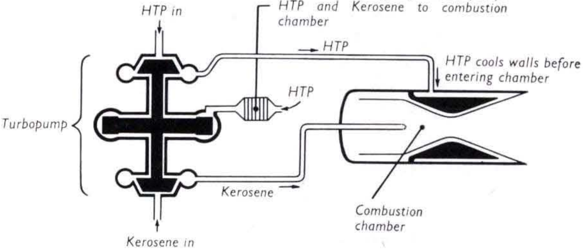
BRISTOL SIDDELEY BS 75 DUCTED FAN ENGINE

Air compressed by low pressure compressor divides here; part is further compressed in the high-pressure compressor and passes to propelling nozzle via combustion system and turbines. Remainder passes through by-pass duct direct to propelling nozzle.


Stator blades
Compressor blades
Combustion system
By-pass duct
Turbine blade
Three-stage low-pressure compressor (front fan)
Ten-stage high-pressure compressor
Independent co-axial shafts connect high-and low-pressure compressors and turbine
Two-stage low-pressure turbine drives low-pressure compressor
Two-stage high-pressure turbine drives high-pressure compressor

Rocket motor. Engine which produces jet thrust without using air for combustion. Two basic types are liquid-propellant and solid-propellant engines. If a monopropellant is used, it decomposes to form gases without combustion. In other cases one propellant is an oxidant which provides oxygen for the combustion of the other propellant which is a rocket fuel.

TYPICAL HTP/KEROSENE ROCKET ENGINE


Catalyst decomposes HTP to drive turbine of turbopump which pumps HTP and Kerosene to combustion chamber
HTP in
HTP
HTP cools walls before entering chamber
HTP
Turbopump
Kerosene
Combustion chamber
Kerosene in

Shaft horse power. Same as brake horse power.

Shaft turbine. Gas-turbine engine which provides shaft power with little remaining jet thrust. Similar to a turboprop engine, but normally used to power helicopters. Also known as turboshaft engine.

Silencer. Sound suppressor attached to the rear of a jet engine to reduce jet noise.

Single-shaft engine. Gas-turbine engine with a single shaft connecting all the compressor and turbine stages. Also known as a single-spool engine.

Solid propellant. Rocket propellant which combines a mixture of fuel and oxidant in solid form.

Specific fuel consumption. Fuel consumption of an engine expressed as the weight of fuel in lb. needed to provide unit power or thrust for one hour. For piston engines usually given in lb./b.h.p./hr., for turbojets in lb./lb. of thrust/hr.

Specific impulse. A measure of the efficiency of rocket propellants. Can be considered as the thrust per unit rate of propellant consumption; e.g. the thrust in lb. for each lb./sec. of propellant used. Its units are thus seconds:

$$\left[\frac{\text{lb.}}{\text{lb./sec.}} = \text{sec.}\right]$$

Specific thrust. Thrust of a jet engine divided by its weight.

Spill burner. Turbine-engine burner in which part of the fuel entering the burner is recirculated instead of entering the combustion chamber.

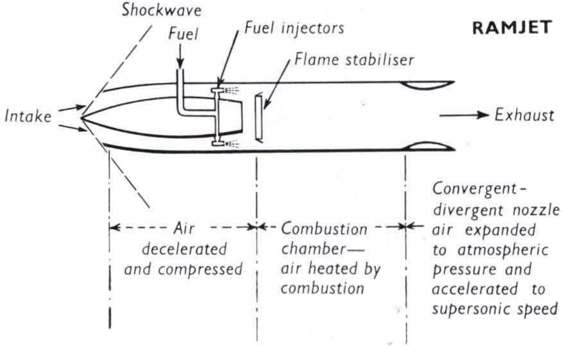
Single-spool engine. See single-shaft engine.

Spool. See two-spool and single-shaft engine.

Stator blade. See axial compressor.

Supercharger. Axial or centrifugal compressor used to increase the density of the air-feed mixture supplied to a piston engine to counteract its decrease in power output with increasing aircraft height.

RAMJET


Shockwave
Fuel
Fuel injectors
Flame stabiliser
Intake
Exhaust
Air decelerated and compressed
Combustion chamber— air heated by combustion
Convergent-divergent nozzle— air expanded to atmospheric pressure and accelerated to supersonic speed

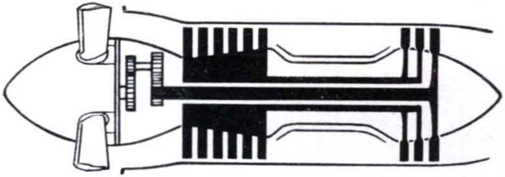
Tailpipe. See jetpipe.

Thrust reverser. Device to reverse the thrust of a turbojet engine for aircraft braking.

Tip jet. Jet of compressed air or combustion gases ejected at the tips of a helicopter rotor to drive it.

Turbine. The part of a gas-turbine engine where energy is extracted from the hot jet stream by blades mounted on a revolving disc. The turbine is attached to a shaft which drives either a compressor or provides a shaft-power output from the engine. It can have one or more stages. In a two-spool engine independent high- and low-pressure turbines drive the independent H.P. and L.P. compressors.

Turbofan engine. Type of turbojet engine in which thrust is increased by a low-pressure compressor (fan) operating in a duct. It can have an oversized low-pressure compressor with part of the flow by-passing the rest of the engine (front-fan engine) or a separate fan driven by a turbine stage (aft-fan engine). The turbofan type of engine is also known as a ducted fan.



FREE-TURBINE TURBOPROP

Turbojet engine. A type of gas-turbine engine which ejects a jet of hot gases to provide propulsive thrust.

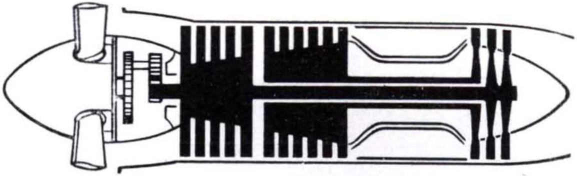
Turboprop engine. Gas-turbine engine in which output is taken as shaft power to drive a propeller via a reduction gear; it also has a small residual jet thrust. Power output can be taken from a free turbine or from the main shaft of a single-shaft engine or two-spool engine. A turboprop engine is sometimes referred to as a prop-jet engine.

Turbopump. Turbine-driven pump used to supply propellant to the combustion chamber of liquid-propellant rocket engines.

Turbo-ramjet engine. Combination engine in which a turbojet and a ramjet engine share a common intake duct and thrust is supplied completely by the turbojet at low speed and almost wholly by the ramjet at high Mach numbers.

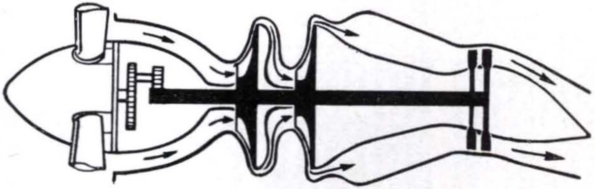
Turboshaft engine. See shaft turbine.

Two-shaft engine. See two-spool engine.



TWO-SPOOL TURBOPROP

Two-spool engine. Turbine engine with two co-axial shafts, and having two compressors driven by independent turbines. Most high-performance turbofan, turbojet and turboprop engines are of this type. Use of a two-spool compressor allows higher pressure ratios (up to about 15 : 1) to be achieved than with a single-spool compressor. A two-shaft engine is almost invariably a two-spool engine, but with a free-turbine arrangement a turboprop can have two co-axial shafts with a single-spool compressor.



SINGLE-SHAFT TWO-STAGE CENTRIFUGAL TURBOPROP

Water injection. Technique used with both piston and turbojet engines to increase take-off power and thrust respectively.

CURRENT TURBINE ENGINES

Manufacturer and name	*Type*	*Take-off power or thrust*	*Take-off s.f.c.*	*Length in.*	*Weight lb.*
BRITAIN:					
Blackburn					
Turmo 603	Free-turbine turboshaft	425 s.h.p.	1·11	47·9*	370
Nimbus (A.129)	Free-turbine turboshaft	968 s.h.p.	0·68	60·0*	390
Bristol Siddeley					
BS.53 Pegasus	Lift/thrust turbofan	*15,000* lb.	—	—	—
Double Mamba ASMD.8	Coupled turboprop	3,880 e.h.p.	0·66	103·4	2,500
Olympus 201	Two-spool turbojet	17,000 lb.	—	126·4	3,950
Olympus 301	Two-spool turbojet	20,000 lb.	—	130·9	—
Orpheus 100	Single-shaft turbojet	4,230 lb.	0·99	77·5	900
Orpheus 701	Single-shaft turbojet	4,700 lb.	1·08	73·0	795
Orpheus 803	Single-shaft turbojet	5,000 lb.	1·09	75·5	835
Proteus 770	Free-turbine turboprop	4,615 e.h.p.	0·57	100·6	2,900
Sapphire ASSa.7R	Single-shaft turbojet	12,230 lb.†	1·38	83·5	3,110
Viper ASV.8	Single-shaft turbojet	1,750 lb.	1·07	67·0	500
Viper ASV.11	Single-shaft turbojet	2,500 lb.	1·07	64·0	549
de Havilland Engines					
Gnome H.1000	Free-turbine turboshaft	1,050 s.h.p.	0·64	54·8*	1,303
Gyron Junior 101	Single-shaft turbojet	7,100 lb.	—	102·9	—
Gyron Junior DGJ.10	Single-shaft turbojet	10,000 lb.	—	70·0*	—
Napier					
Eland 504	Single-shaft turboprop	3,500 e.h.p.	0·61	95·5*	1,820
Gazelle NGa.2	Free-turbine turboshaft	1,750 e.h.p.	0·68	70·0*	870
Gazelle NGa.13	Free-turbine turboshaft	1,540 e.h.p.	0·69	70·0*	890
Rolls-Royce					
Avon RA.24	Single-shaft turbojet	11,250 lb.	—	126·0	—
Avon RB. 146	Single-shaft turbojet	16,000 lb.†	—	145·0	—
Avon RA.29/6	Single-shaft turbojet	12,725 lb.	0·78	134·0	3,471
Conway RCo.11	Turbofan (by-pass)	17,250 lb.	—	136·0	—
Conway RCo.12	Turbofan (by-pass)	17,500 lb.	0·73	136·0	4,542
Conway RCo.15	Turbofan (by-pass)	18,500 lb.	0·70	136·0	4,582
Conway RCo.42	Turbofan (by-pass)	20,250 lb.	0·62	150·0	5,001
Dart RDa.6	Single-shaft turboprop	1,650 e.h.p.	0·73	98·0	1,106
Dart RDa.7/2	Single-shaft turboprop	2,020 e.h.p.	0·69	98·0	1,227
Dart RDa.10/1	Single-shaft turboprop	3,030 e.h.p.	—	98·0	1,376
RB.108	Jet-lift turbojet	2,010 lb.	—	42·0	248
Spey RB.163	Turbofan (by-pass)	9,850 lb.	0·56	110·0	2,200
Tyne RTy.1	Two-spool turboprop	4,785 e.h.p.	0·51	108·7	2,275
Tyne RTy.11	Two-spool turboprop	5,325 e.h.p.	0·48	108·7	2,275
Tyne RTy.12	Two-spool turboprop	5,500 e.h.p.	0·47	108·7	2,177
CANADA:					
Orenda Engines					
Orenda 14	Single-shaft turbojet	7,500 lb.	1·00	143·6	2,470
EAST GERMANY:					
Type 014	Single-shaft turbojet	6,945 lb.	0·85	161·4	2,200
FRANCE:					
Snecma					
Atar 8	Single-shaft turbojet	9,700 lb.	0·98	112·0	2,312
Atar 9C	Single-shaft turbojet	14,080 lb.†	2·08†	266·0	2,755
Turboméca					
Artouste II	Single-shaft turboshaft	400 s.h.p.	0·94	57·0*	360
Artouste III	Single-shaft turboshaft	550 s.h.p.	0·65	58·0	410
Astazou	Single-shaft turboprop	495 e.h.p.	0·62	57·0	320
Bastan	Single-shaft turboprop	855 e.h.p.	0·65	60·9*	607
Marboré VI	Single-shaft turbojet	1,058 lb.	1·08	56·0	322
Palouste IV	Air-bleed gas turbine	252 gas h.p.	1·23	47·0	198
Turmo IIIB	Free-turbine turboshaft	812 s.h.p.	0·67	65·0	560
ITALY:					
Fiat					
Fiat 4700	Air-bleed gas turbine	542 gas h.p.	0·55	51·2	304
JAPAN:					
Nippon Jet-Engine Co.					
Nippon J3-1	Single-shaft turbojet	2,646 lb.	—	72·9	815

Manufacturer and name	*Type*	*Take-off power or thrust*	*Take-off s.f.c.*	*Length in.*	*Weight lb.*
U.S.A:					
Allison					
J71-A-2	Single-shaft turbojet	10,200 lb.	0·80	191·0	4,090
T63	Free-turbine turboprop	250 s.h.p.	0·70	38·5*	106
T56-A-7	Single-shaft turboprop	4,050 e.h.p.	—	145·2	—
Model 501-D13	Single-shaft turboprop	3,750 e.h.p.	0·54	145·2	1,750
Continental					
J69-T-19B (Turboméca Marboré)	Single-shaft turbojet	1,060 lb.	1·27	61·5	317
Model 356-9	Single-shaft turbojet	1,400 lb.	1·04	46·3	335
General Electric					
J47-GE-33	Single-shaft turbojet	7,650 lb.†	2·00†	228·0	3,196
J79-GE-7	Single-shaft turbojet	15,800 lb.	1·97	208	3,375
CJ-805-3	Single-shaft turbojet	11,200 lb.	0·81	188·9	3,190
CJ-805-23A	Rear-fan turbofan	16,100 lb.	0·54	144·0	3,750
J85-GE-5	Single-shaft turbojet	2,500 lb.	1·01	104·2	525
J93-GE-3	Single-shaft turbojet	*30,000* lb.†	—	—	—
T58-GE-6 (CT58)	Free-turbine turboshaft	1,050 s.h.p.	0·64	55·0*	280
T64-GE-4	Single-shaft turboprop	2,570 e.h.p.	0·52	113·0	1,079
Lycoming					
T53-L-3	Free-turbine turboprop	1,005 e.h.p.	0·69	58·9	530
T53-L-5	Free-turbine turboshaft	960 s.h.p.	0·70	47·6	485
Pratt & Whitney					
J60-P-3 (JT12A-5)	Single-shaft turbojet	3,000 lb.	0·96	76·0	436
J52-P-4 (JT8)	Two-spool turbojet	7,250 lb.	0·80	—	—
J57-P-16	Two-spool turbojet	16,900 lb.†	2·30†	267·2	4,750
JT3C-6	Two-spool turbojet	13,500 lb.	0·78	167·5	4,234
TF33-P-3 (JT3D-2)	Turbofan	17,000 lb.	0·52	180·0	3,900
J75-P-17	Two-spool turbojet	24,500 lb.†	2·15†	237·6	5,875
JT4A-9	Two-spool turbojet	16,800 lb.	0·81	144·1	5,050
T34-P-9W	Single-shaft turboprop	7,500 e.h.p.	0·55	155·1	2,870
Solar					
YT62 Titan	Single-shaft turboshaft	190 s.h.p.	1·10	33·0	170
Westinghouse					
J34-WE-46	Single-shaft turbojet	3,400 lb.	1·05	111·4	120·7
Wright					
J65-W-18 (Sapphire)	Single-shaft turbojet	10,500 lb.†	—	182·0	3,425
U.S.S.R.:					
Mikulin RD-3M	Single-shaft turbojet	19,180 lb.	*0·90*	*200*	*5,100*
Ivchenko AI-20	Turboprop	4,000 s.h.p.	—	—	—
Kuznetsov NK-012M	Turboprop	12,000 s.h.p.	0·57	236·2	5,070

Notes: Italic figures are provisional or estimates. Values of s.f.c. are in lb./lb. of thrust/hr. or lb./e.h.p./hr. as appropriate. Except where marked *, engine lengths are with exhaust cone. Figures which apply with afterburning are marked †.

CURRENT PISTON ENGINES

Manufacturer and name	*Type*	*Take-off power b.h.p.*	*Length in.*	*Weight lb.*
BRITAIN:				
Alvis				
Leonides 514/8A	9-cylinder radial	550	54·4	795
Leonides 521/2*	9-cylinder radial	500	55·0	790
Leonides 531/8	9-cylinder radial	640	54·4	860
Leonides Major 755*	14-cylinder two-row radial	795	54·9	1,110
Blackburn				
Bombardier 702/208	4-cylinder in-line	180	45·9	375
Bristol Siddeley				
Centaurus 661	18-cylinder two-row radial	2,625	74·6	3,460

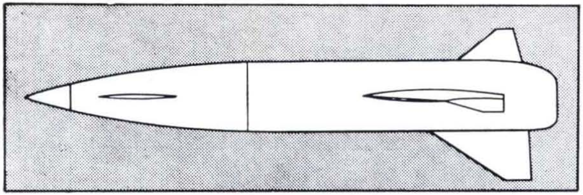
Manufacturer and name	*Type*	*Take-off power b.h.p.*	*Length in.*	*Weight lb.*
de Havilland Engines				
Gipsy Queen 70 Mk. 3	6-cylinder in-line	400	71·8	708
Gipsy Major 215	4-cylinder in-line	215	51·0	415
Rolls-Royce				
Griffon Mk. 57	12-cylinder in-line	2,435	83·5	2,115
CZECHOSLOVAKIA:				
Walter				
Minor 4-III	4-cylinder in-line	105	40·6	199
Minor Sc. (M-332)	4-cylinder in-line	140	43·4	225
Minor 6-III	6-cylinder in-line	160	49·2	280
Praga				
Doris B	6-cylinder horizontally opposed	220	48·4	436
FRANCE:				
Ardem				
4 CO 2	4-cylinder horizontally opposed	30·7	16·0	133
Potez				
4-E.00	4-cylinder horizontally opposed	96	27·1	203
4 D 34	4-cylinder in-line	260	48·0	403
Snecma				
(Bristol) Hercules 758	14-cylinder two-row radial	2,040	—	2,175
Renault				
12T	12-cylinder in-line	600	53·7	—
GERMANY:				
Pollmann				
HEPU KFM 40/3500	4-cylinder horizontally opposed	40	13·4	106
Porsche				
678/4	4-cylinder horizontally opposed	75	—	225
INDIA:				
Hindustan				
P.E.90H	4-cylinder horizontally opposed	90	32·0	180
ITALY:				
Agusta				
G.A.40	2-cylinder horizontally opposed	42	24·1	104
G.A.70/0 (and 70V*)	4-cylinder horizontally opposed	86	29·5	150
JAPAN:				
Kawasaki				
KAE-240	6-cylinder horizontally opposed	260	—	440
POLAND:				
Narkiewicz				
WN-3	7-cylinder radial	340	34·9	530
WN-6	6-cylinder horizontally opposed	180	42·9	346
WN-7	4-cylinder horizontally opposed	125	37·0	232
SPAIN:				
Enma				
Flecha F-IV-1	4-cylinder horizontally opposed	93	31·8	220
Tigre G-IV-B5	4-cylinder in-line	150	47·7	323
Alcion A-1	7-cylinder radial	275	45·9	495
Sirio S-2	7-cylinder radial	500	45·7	785
Beta B-4	9-cylinder radial	775	46·0	1,070
U.S.A.:				
Continental				
A65-8F	4-cylinder horizontally opposed	65	30·4	167
C85-12F	4-cylinder horizontally opposed	85	31·3	179
C90-12F	4-cylinder horizontally opposed	95	31·3	187
O-200-A	4-cylinder horizontally opposed	100	28·5	190
O-300-A (and B, C, D)	6-cylinder horizontally opposed	145	39·8	277
O-470-K and L	6-cylinder horizontally opposed	230	36·0	404
IO-470-D	6-cylinder horizontally opposed	260	43·3	426
FSO-526-A*	6-cylinder horizontally opposed	270	50·3	575
GTSIO-520	6-cylinder horizontally opposed	390	—	459

Manufacturer and name	*Type*	*Take-off power b.h.p.*	*Length in.*	*Weight lb.*
Franklin				
6VS-335	6-cylinder vertically opposed	225	29·0	310
Lycoming				
O-235-C1	4-cylinder horizontally opposed	115	29·6	237
O-290-D2B	4-cylinder horizontally opposed	140	29·6	264
O-320-B2B	4-cylinder horizontally opposed	160	29·6	278
O-360-A1A	4-cylinder horizontally opposed	180	29·6	285
VO-360-A1A*	4-cylinder vertically opposed	180	29·8	298
VO-435-A1E	6-cylinder vertically opposed	250	34·7	392
GO-480-B1D	6-cylinder horizontally opposed	295	40·6	432
IGSO-480-A1A6	6-cylinder horizontally opposed	340	47·6	496
O-540-A1A5	6-cylinder horizontally opposed	250	37·2	369
VO-540-A1A*	6-cylinder vertically opposed	310	34·7	435
VSO-580-A1A*	8-cylinder vertically opposed	400	49·2	574
McCulloch				
4318 E	4-cylinder horizontally opposed	72	27·0	77
TC 6150	6-cylinder horizontally opposed	120	44·5	142
Nelson				
H-63B (YO-65)	4-cylinder horizontally opposed	43	18·0	80
Pratt & Whitney				
R-985	9-cylinder radial	450	—	684
R-1340 SIH1	9-cylinder radial	600	43·0	877
R-2000 D5	14-cylinder two-row radial	1,450	59·7	1,585
R-2800 CB17	18-cylinder two-row radial	2,500	81·4	2,390
Wright				
R-1300-3	7-cylinder radial	800	49·7	1,080
R-1820-82	9-cylinder radial	1,525	50·1	1,469
R-3350 TC18EA6	18-cylinder two-row radial	3,440	89·5	3,675
U.S.S.R.:				
ASh-82T	14-cylinder two-row radial	1,900	79·1	2,250
M-11FR	5-cylinder radial	160	37·4	353
Ivchenko AI-14R	9-cylinder radial	240	—	—
Ivchenko AI-14V*	9-cylinder radial	275	—	—
Ivchenko AI-260	7-cylinder radial	575	—	—

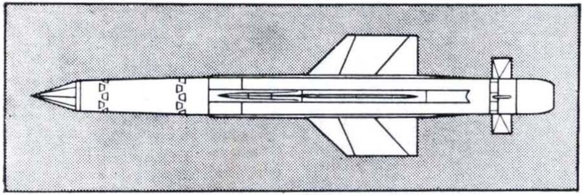
Note: Engines marked * are helicopter powerplant versions.

ROCKET ENGINES

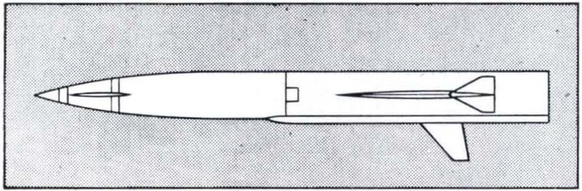
Manufacturer and name	*Type*	*Max. thrust lb.*	*Length in.*	*Weight lb.*
BRITAIN:				
Bristol Siddeley				
Stentor	Two-chamber HTP/kerosene missile engine	20,000 (estimated)	—	—
de Havilland Engines				
Spectre DSpe. 4	Single-chamber HTP/kerosene assisted take-off rocket engine	8,000	59·2	1,393
Napier				
Double Scorpion	Two-chamber HTP/kerosene aircraft flight engine	6,000	35·0	216·4
FRANCE:				
S.E.P.R.				
841	Single-chamber nitric acid/TxII aircraft flight engine	3,374	132	259
U.S.A.:				
Thiokol (Reaction Motors)				
LR-11-RM5	Four-chamber liquid oxygen/kerosene aircraft flight engine	6,000	56·0	210
XLR99-RM-2 Pioneer	Single-chamber liquid oxygen/ammonia aircraft flight engine	58,500	72	900



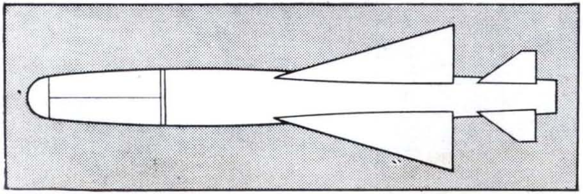
(Above) Avro Blue Steel



(Above) De Havilland Firestreak



(Above) Matra R.511 (below) Matra R.530



AIR-LAUNCHED MISSILE DIRECTORY

BRITAIN

Avro Blue Steel A.A.M. This stand-off bomb is being developed for carriage by the Victor B.2 and Vulcan B.2 V-bombers of the R.A.F.; each aircraft will carry one Blue Steel. Powered by a two-chamber Bristol Siddeley Stentor HTP/kerosene rocket engine, the Blue Steel is a supersonic cruise missile which carries a thermonuclear warhead and is inertially guided. Blue Steel test vehicles were powered by a 16,000-lb. thrust de Havilland Double Spectre rocket engine and test launched at Aberporth and Woomera. Tests with representative Blue Steels powered by Stentors are now being made at Woomera.

Length, 35 ft.; *span*, 13 ft.; *range*, 150 miles (estimated).

de Havilland Firestreak A.A.M. Firestreak A.A.M.s are in service as the armament of Royal Navy Sea Vixens, and R.A.F. Javelins, each of which carries four missiles, and R.A.F. Lightnings, which carry two missiles each. Powered by a single solid-propellant motor, Firestreak has an infra-red guidance system and homes on the heat emitted by the engines of the target aircraft. Its high-explosive warhead is fired by an infra-red proximity fuse. The missile has fixed cruciform wings and cruciform control surfaces at its tail. Firestreak was code-named Blue Jay; de Havilland Propellers are now developing a more advanced A A.M. code-named Red Top. This may well be the advanced version of Firestreak known as Firestreak 4.

Length, 10 ft. 5½ in.; *span* 2 ft. 5½ in.; *weight*, 300 lb.; *speed*, Mach 2 +; *range*, up to 4 miles.

FRANCE

Matra R.511 A.A.M. In production for French Air Force Vautour II-N all-weather fighters the R.511 is a twist-and-steer A.A.M. with semi-active radar homing. Each Vautour carries four missiles. The R.511 has a fixed wing, a moving foreplane and a rudder below its wing. It is powered by a two-stage solid-propellant motor with a booster stage giving 3,530 lb. thrust for 3 sec. and as stainer which burns for 13½ sec. and gives 440 lb. thrust. The missile has a high-explosive warhead.

Length, 10 ft. 2 in.; *span*, 3 ft. 3½ in.; *weight*, 397 lb.; *speed*, Mach 1·8; *max. range*, 4·35 miles.

Matra R.530 A.A.M. Under development as the armament of French Air Force Mirage and Vautour interceptors, the R.530 will enter service in 1962. It is a cruciform missile with fixed wings and moving tail controls. Infra-red and semi-active radar guidance systems have been tested and the production missile will probably rely on a semi-active system. The missile is powered by a two-stage solid-propellant motor. No details of size, weight or performance are available.

Nord 5103 (AA.20) A.A.M. In service with both the French Air Force and Navy, the AA.20 is a cruciform missile with visual command guidance by coded radio link. It forms the armament of Mystère IVA, Super Mystère, Vautour and Aquilon interceptors. Powered by a two-stage solid-propellant motor, the AA.20 is controlled by deflection of the sustainer motor nozzle. A proximity-fused high-explosive warhead is used.

Length, 8 ft. 6½ in.; *span*, 2 ft. 7½ in.; *weight*, 293 lb.; *speed*, Mach 1·7; *max. range*, 2½ miles.

Nord 5104 (AA.25) A.A.M. Externally similar to the AA.20, the AA.25 is an improved version of this missile. Intended for Super Mystère and Mirage interceptors, it is already in service. In place of the AA.20 visual command guidance system it has radar command guidance, allowing it to be used at night and in cloud.

Dimensions, as for AA.20; *weight*, 398 lb.; *speed*, Mach 1·7; *max. range*, 3 miles.

Nord AS.30 A.S.M. Larger than the AS.20 this missile may arm the Mirage III, the Etendard IVM and the Vautour. Few details are available, but it has radio command guidance and a nuclear warhead is under development. Performance given below is provisional.

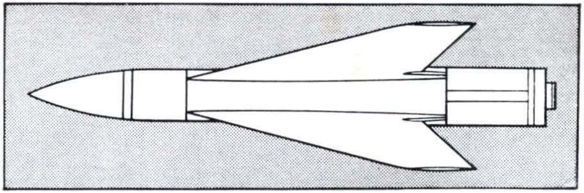
Length, 12 ft. 9½ in.; *span*, 3 ft. 3½ in.; *weight*, 1,124 lb.; *speed*, Mach 2; *max. range*, 6 miles.

Nord SS.10, SS.11, AS.12. This family of simple wire-guided anti-tank missiles has been developed over the years by Nord. They are suitable for mounting on light aircraft and helicopters for ground-attack duties. All are cruciform missiles, with visual command guidance signals transmitted to the missile via a trailing wire. They are powered by two-stage solid-propellant motors. The SS.11 is in quantity production and the AS.12 is expected to enter production in 1961. It will be carried by the Breguet Alizé and other French naval aircraft. The AS.12 can employ either wire or radio guidance, the radio equipment being identical to that developed for the AS.30.

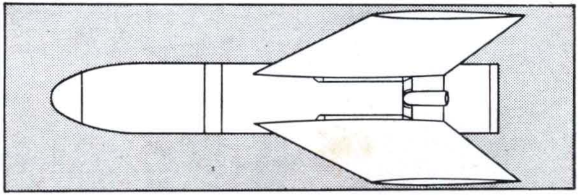
(SS.10) *Length*, 2 ft. 10 in.; *span*, 2 ft. 5½ in; *weight* (in container), 33 lb.; *speed*, 177 m.p.h.; *max. range*, 1,640 yds.

(SS.11) *Length*, 3 ft. 8¾ in.; *span*, 1 ft. 7½ in.; *weight*, 64 lb.; *speed*, 273 m.p.h.; *max. range*, 3,280 yds.

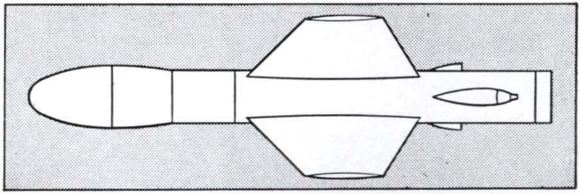
(AS.12) *Length*, 6 ft. 3 in.; *span*, 2 ft. 1½ in.; *weight*, 165 lb.; *speed*, 435 m.p.h.; *max. range*, 4 miles.



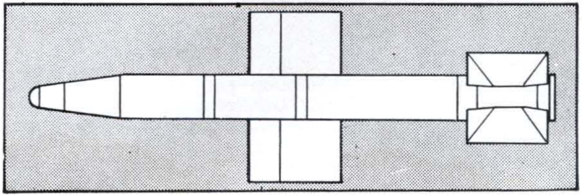
(Above) Nord 5103 (AA.20)

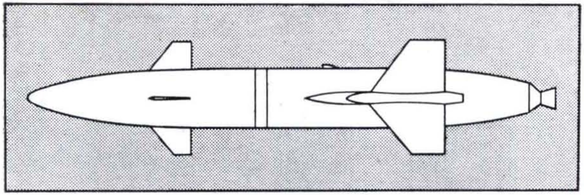


(Above) Nord SS.11

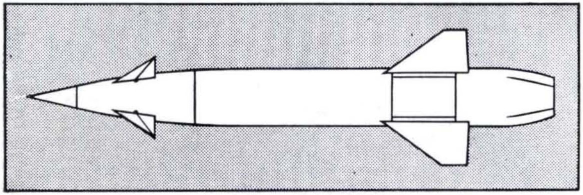


(Above) Nord SS.12 (below) Sispre C.7

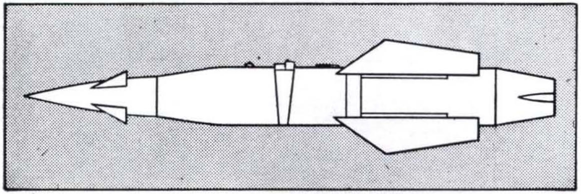




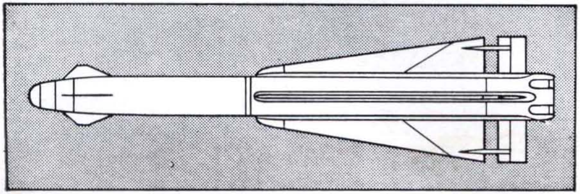
(Above) Robot 304



(Above) ASM-N-7A Bullpup A



(Above) ASM-N-7B Bullpup B (below) GAR-3A Falcon



ITALY

Sispre C.7 A.A.M. This simple A.A.M. is expected to enter service in 1961 on Italian Air Force Sabres and Fiat G.91s. It is of monoplane layout with moving wings which move together for pitch and differentially for roll control; there are fixed cruciform tail surfaces. Powered by a solid-propellant rocket motor, it uses infra-red homing.

Length, 6 ft. 5 in.; *span*, 2 ft. 1¼ in.; *weight*, 154 lb.

SWEDEN

Robot 304 A.S.M. This short-range missile is in service with SAAB-32A Lansens of the Royal Swedish Air Force. It has cruciform nose control surfaces and a fixed monoplane wing with ailerons. Intended for attacks on shipping, it is radio command guided and has a high-explosive warhead weighing about 550 lb.

Length, 14 ft. 6 in.; *span*, 6 ft. 6 in.; *weight*, 1,200 lb.; *speed*, Mach 0·95; *range*, 2·8 miles.

U.S.A.

Bullpup A.S.M. This simple Martin missile is carried for ground-attack missions by both U.S.A.F., U.S. Navy and U.S. Marine Corps aircraft. The A4D Skyhawk can carry three Bullpups and the FJ-4B Fury can take five. U.S.A.F. F-100 and F-105 squadrons are also equipped with the missile. It has cruciform control foreplanes and fixed cruciform wings and is powered by a rocket motor using prepackaged liquid propellants. The missile is visually command guided to its target by a radio link; the pilot uses a hand switch to transmit guidance signals. No ground checks are needed for the Bullpup; it is treated as a round of ammunition.

The initial ASM-N-7 Bullpup was based on a standard 250 lb. bomb and a solid-propellant motor. The ASM-N-7A is the current production version; it has an improved warhead and a liquid-propellant motor. The U.S.A.F. equivalent to this version is the GAM-83A. Under development is the GAM-83B (ASM-N-7B) which has improved guidance and alternative conventional and nuclear warheads. The TGAM-83 is a training version of the missile.

(ASM-N-7A) *Length*, 10 ft. 6 in.; *span*, 3 ft. 1 in.; *weight*, 570 lb.; *speed*, Mach 1·8; *range*, over 2 miles.

Eagle A.A.M. Now under development as armament of the Douglas Missileer, the Eagle will be an A.A.M. of unprecedented range and performance. Main contractors are Bendix and Grumman. A combination of guidance systems will be used for the missile, which will have a maximum range of

100 miles. It is intended to intercept aircraft travelling at up to Mach 3 and at heights between ground level and 100,000 ft.

Length, approx. 15 ft.; *weight*, approx. 2,000 lb.; *speed*, Mach 4; *max. range*, 100 miles.

Falcon A.A.M. Many variants of this cruciform missile have been developed and produced for the U.S.A.F. by Hughes. It has cruciform wings and control surfaces and a solid-propellant rocket motor. Production is now concentrated on the Super Falcon and Nuclear Falcon. Some 25,000 of the earlier GAR-1 and GAR-2 Falcons were built before their production ended. Falcons of this type are widely used, in particular as armament of the F-89 Scorpion, F-102 Delta Dagger and F-101B Voodoo. The initial production version was the GAR-1, with semi-active radar guidance. This was followed by an improved version, the GAR-1D, with better performance and manœuvrability at altitude. The GAR-2A has a similar airframe to the GAR-1D, but has an infra-red homing system. Interceptors usually carry mixed loads of both semi-active and infra-red versions.

The Super Falcon is a more advanced version introduced in 1958; it has a greater speed, range and ceiling than earlier Falcons. Main production versions are the GAR-3A, with semi-active homing, and GAR-4A with infra-red guidance.

The GAR-11 Nuclear Falcon entered service with F-102 squadrons in 1960 and is the first guided air-to-air missile with a nuclear warhead. It has the same control and semi-active guidance systems as the GAR-1D and can be carried on the F-102 instead of this missile without modification to the aircraft's launchers and fire-control system.

(Falcon) *Length*, 6 ft. 6 in. (GAR-1D), 6 ft. 7½ in. (GAR-2A); *span*, 1 ft. 8 in.; *weight*, 110 lb. (GAR-1D), 122 lb. (GAR-2A); *speed*, above Mach 2; *range*, 5 miles.

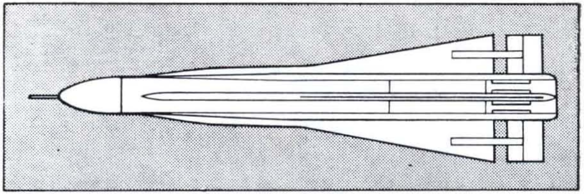
(Super Falcon) *Length*, 7 ft. 2 in. (GAR-3A), 6 ft. 9 in. (GAR-4A); *span*, 2 ft.; *weight*, 150 lb. (GAR-3A), 145 lb. (GAR-4A); *speed*, Mach 3; *range*, 7 miles.

(Nuclear Falcon) *Length*, 7 ft.; *span*, 1 ft. 8 in.; *weight*, 203 lb.; *speed*, Mach 2; *range*, under 5 miles.

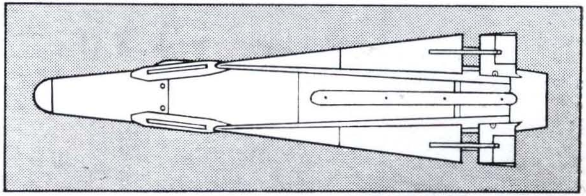
Genie A.A.M. Designated the MB-1, this unguided missile has a nuclear warhead with a lethal radius greater than 1,000 ft. It is carried by three U.S.A.F. interceptors, the F-89J, F-101B and the F-106. The Genie has a solid-propellant Aerojet rocket motor. Its only controls are flip-out fins which help compensate for gravity drop during its flight. A guided version is being developed.

Length, 8 ft.; *span*, 2 ft.

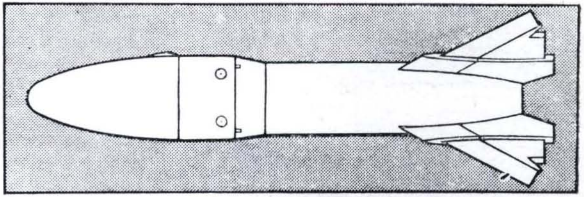
Hound Dog A.S.M. This strategic missile entered service on



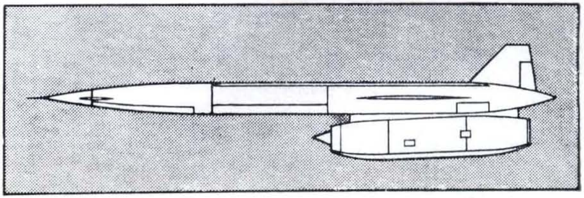
(Above) GAR-4A Falcon

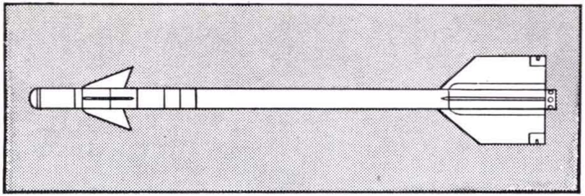


(Above) GAR-11 Nuclear Falcon

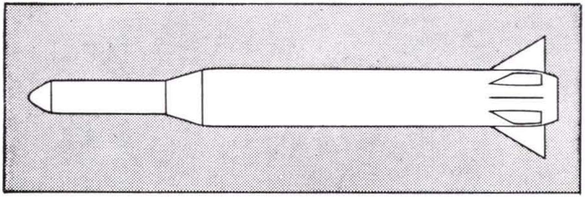


(Above) MB-1 Genie (below) Hound Dog

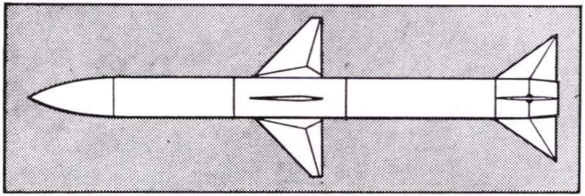




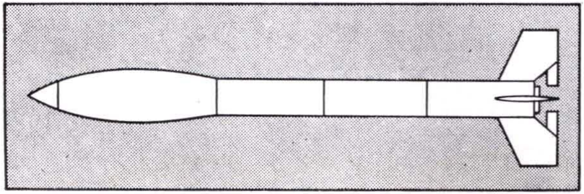
(Above) AAM-N-7 Sidewinder



(Above) GAM-87A Skybolt



(Above) AAM-N-6 Sparrow 3 (below) M-100A



U.S.A.F. B-52G bombers in 1960. Developed by North American, it is a turbojet-propelled supersonic-cruise missile with delta foreplane control, and a rudder and ailerons on its delta wing. Its podded J52 turbojet is mounted under the body. Hound Dog carries a thermonuclear warhead and has an inertial guidance system which is monitored by start rackers.

Length, 43 ft.; *span*, 12 ft.; *cruise speed*, Mach 1·6; *range*, 600 miles.

Quail. Designated GAM-72, the McDonnell Quail is a decoy missile carried by B-52G bombers and launched to confuse enemy defences. Powered by a J85 turbojet, the Quail has folding wing surfaces which allow it to be carried inside a B-52 bomb-bay. The radar echo from a Quail is the same as that given by a B-52.

Length, 12 ft. 10 in.; *span*, 5 ft. 4 in.; *weight*, 1,100 lb.; *speed*, Mach 0·9; *range*, 230 miles.

Sidewinder A.A.M. Developed by the Naval Ordnance Test Station, the Sidewinder is a very simple and cheap infra-red homing missile which has been produced in great quantity and widely adopted. In production since 1953, it has been supplied to many foreign navies and air forces, including the Royal Navy. Powered by a solid-propellant rocket motor, the Sidewinder has cruciform control foreplanes and fixed cruciform tail fins. Its high-explosive warhead is fired by a proximity fuse. An improved version, the Sidewinder 1C, is under development. The Navy designation for the current missile is AAM-N-7; the U.S.A.F. designation is GAR-8.

Length, 9 ft. 5 in.; *span*, 1 ft. 7 in.; *weight*, 155 lb.; *speed*, Mach 2·5; *range* (at 50,000 ft.), 11,000 ft.

Skybolt A.L.B.M. Under development by Douglas, this air-launched ballistic missile will be carried by U.S.A.F. B-52s and R.A.F. Vulcan B.2s. It should enter service in 1964. Skybolt has the U.S.A.F. designation GAM-87A. It is a two-stage missile powered by Aerojet solid-propellant rocket motors and will use a stellar-inertial guidance system. The missile will have a range of 1,000 miles and carry a thermonuclear warhead.

Sparrow 3 A.A.M. Developed by Raytheon for the U.S. Navy, the Sparrow 3 is in service with the McDonnell F3H and will also form the armament of the F4H Phantom II. The missile has moving cruciform wings and fixed cruciform tail fins. Early versions had a solid-propellant rocket motor, current missiles have a prepackaged liquid-propellant motor. Semi-active radar homing is used and the missile has a high-explosive warhead. Its U.S. Navy designation is AAM-N-6.

Length, 12 ft.; *span*, 3 ft. 3 in.; *weight*, 350 lb.; *speed*, Mach 2·5; *range*, 5 miles.

U.S.S.R.

Chm A.A.M. The ChM has a radio or radar guidance system and a proximity-fuse high-explosive warhead. Four missiles of this type are carried by the Yak-25 all-weather and night fighter, but no details are available for publication at the time of closing for press.

M-100A A.A.M. This fairly unsophisticated missile was first placed in service during the Korean War but there are no recorded instances of its use during that conflict. Employing an infra-red guidance system, the M-100A has a 1,000 lb. thrust solid-propellant motor, and its high-explosive warhead is fired by an infra-red proximity fuse. The missile has cruciform control surfaces at its tail, and also exists in an unguided version. First seen mounted under the wings of MiG-15s, the M-100A is widely used by the Soviet Air Forces, and four missiles of this type are usually carried underwing by the MiG-19 and MiG-21 interceptors.

Length, 4 ft. 3½ in.; *span*, 1 ft; *launching weight*, 18·5 lb.; *speed*, Mach 2·65; *range*, 3·4 to 5 mls.

Few details are available concerning current Soviet air-launched missiles, but it is known that at least twelve types of missile are in widespread use. These include a 210-mm. A.S.M. which is visually command guided to its target by radio link and exists in versions with both solid-propellant and liquid-propellant motors; a 220-mm. A.A.M. with semi-active radar homing, a high-explosive warhead and liquid-propellant motor; and a 325-mm. with cruciform wings and control surfaces, a solid-propellant motor and either semi-active radar or infra-red homing. Air-launched ballistic missiles are carried by Bounder bombers, and at least two types of stand-off bomb have been seen mounted beneath the Tu-16 Badger.

GLOSSARY OF AIR-LAUNCHED MISSILE TERMS

A.A.M. See air-to-air missile.

Active homing. Guidance system in which a missile homes on reflections from the target of radar signals which the missile itself has transmitted.

A.I. radar. Radar search equipment carried by fighter aircraft to give information on target position for air-to-air missile attack. (A.I. = airborne interception). See fire-control system.

Air-to-air missile (A.A.M.). Guided missile carried by an aircraft for launching against other airborne vehicles.

A.L.B.M. Air-launched ballistic missile.

Air-to-surface missile (A.S.M.). Guided missile carried by an aircraft for launching against ground targets. A.S.M.s can be ballistic or aerodynamic and used in either tactical or strategic rôles.

All-burnt. Term describing the stage in a missile's flight when all its fuel has been consumed; after this the missile is unpowered and coasts.

A.S.M. See air-to-surface missile.

Ballistic missile. Missile which is guided only during its powered flight and covers most of the distance to its target on a ballistic trajectory. During this time its course depends on its initial velocity and gravity; it travels in the same way as a thrown stone or a howitzer shell.

Beam rider. A guided missile which travels to its target along a radar beam which is locked onto the target.

Booster rocket. Rocket motor used to accelerate a missile when it is launched. Some missiles have boosters which are jettisoned when they burn out, others have two-stage motors which give a high thrust at launch and a lower thrust for sustained flight.

Burn-out. Same as all-burnt.

Coasting flight. Flight of a missile after its rocket motor has ceased to burn.

Collision-course attack. Form of air-to-air attack in which an interceptor flies a course allowing it to make a broadside attack on its target. Rockets are usually launched under automatic control.

Command guidance. Guidance system in which a missile is tracked either visually or by radar and correction signals are transmitted to ensure that it takes up the appropriate course to hit its target.

Continuous-wave radar. Radar system in which a transmitter sends out a continuous flow of radio energy rather than pulses. It allows moving targets to be picked up against a fixed background such as the earth's surface.

Cruciform. Wing or control-surface arrangement in which, in head-on view, the surfaces form a cross at right angles and are of equal span.

Fire-control system. Computer system used to control an interception. It locks the aircraft onto its target in conjunction with A.I. and ground radar and via the autopilot steers the correct interception course and launches air-to-air missiles automatically.

Ground-controlled interception (G.C.I.). Interception of enemy aircraft by using ground radar to direct fighters. It is normal practice for interceptions with air-to-air missiles.

Guidance. Technique for controlling the flight path of a missile after launch to ensure that it hits its target. See active, semi-active and passive homing and inertial guidance.

Homing head. The section of a missile which directs it to its target.

Inertial guidance. Guidance system which depends on very accurate measurement of accelerations along three axes to compute flight path, position and velocity, and hence to make necessary corrections. The system is completely self-contained and immune to jamming.

Infra-red guidance. See passive homing.

Kinetic heating. Heating of the surfaces of a missile or aircraft at high supersonic speed caused by air friction.

Launcher. Equipment used to hold an air-to-air missile in position on an aircraft and to guide its initial motion during launching. A zero-length launcher supports the missile but does not guide it at the launch.

Miss distance. For an air-to-air missile, the distance between a missile and its target when they are closest together, assuming they do not collide.

Passive homing. Guidance system in which a missile homes on to energy emitted by its target. A typical example is infra-red homing in which the missile homes on the heat given out by the jetpipes of the target aircraft.

Proximity fuse. Electronic or infra-red fuse which explodes the warhead of missile when it is at its closest to its target.

Rocket projectile. Small unguided rocket powered by a solid propellant; used for either air-to-air or air-to-ground attacks.

Semi-active homing. Guidance system in which a missile homes on reflections from the target of radar signals transmitted by a source outside the missile.

Spin stabilisation. The flight of unguided rockets can be stabilised by using fins to spin them. Effect is similar to the spinning of rifle bullets.

Stand-off bomb. Alternative name for an air-to-surface missile, usually of the long-range strategic type.

Sustainer motor. Motor which supplies the main propulsive thrust of a missile and takes over after its booster (if any) has burnt out.

Tracking flares. Flares attached to a missile which relies on visual command guidance so that its operator can follow its course and ensure the necessary corrections are made for it to hit the target.

Trajectory. Flight path of a missile.

Twist and steer. Control system for missiles of aircraft layout which have ailerons and elevators. Changes of course are made by rolling the missile and then using the elevators. Missiles of cruciform layout do not need to roll in this way to change direction.

Warhead. Part of a missile containing the charge of either conventional or nuclear explosive needed to destroy the target.

Wire guidance. Use of a fine wire fed out from a missile to transmit guidance signals to it. Commonly used for anti-tank missiles.

INTERNATIONAL AIRCRAFT RECORDS

ALL aviation record attempts come under the control of the Fédération Aéronautique Internationale with headquarters in Paris, the members of the F.A.I. being the national aero clubs or associations of the various countries participating in the organisation. There are currently eight record classes, each of which has a number of divisions and sub-divisions. These classes are as follows: Class A (Free Balloons); Class B (Dirigibles); Class C (Aircraft); Class D (Gliders); Class E (Rotorcraft); Class F (Models); Class G (Parachutes); Class H (Jet-lift Aircraft). Class C is divided into Group I which embraces all aircraft whose power is partially or totally derived from a source other than a reciprocating engine (e.g. rocket, turbojet, ramjet, turboprop, etc.), and Group II which includes all aircraft powered by reciprocating engines only.

There are only five official records which carry the title of "World Record". These represent the best figures attained regardless of class and are: (*a*) Speed over a straight course; (*b*) Speed round a closed circuit; (*c*) Altitude; (*d*) Distance in a straight line, and (*e*) Distance round a closed circuit. At the present time, four of the five World Records are held by the U.S.A. These records are as follows:

Speed over a Straight Course: Major Joseph W. Rogers, U.S.A.F., on December 15, 1959, in a Convair F-106A. 1,525·93 m.p.h.

Speed round a Closed Circuit: Commander John F. Davis, U.S.N., on September 25, 1960, in a McDonnell F4H-1. 1,390·22 m.p.h.

Altitude: Colonel Georgy Mosolov, Sov.A.F., on April 28, 1961, in "E-66". 112,205 ft.

Distance in a Straight Line: Commander Thomas D. Davies, Commander Eug. P. Rankin, Commander S. Reid, and Lt.-Commander Ray A. Tabeling, on September 29–October 1, 1946, in a Lockheed P2V-1 Neptune. 11,235·946 mls.

Distance round a Closed Circuit: Lt.-Colonel Thomas R. Grisson, U.S.A.F., on December 14, 1960, in a Boeing B-52G Stratofortress. 10,057·913 mls.

The following international records in F.A.I. Class C were correct at March 31, 1961. The name of the pilot is given in each case.

GROUP I

Distance—Closed Circuit (U.S.A.): Lt.-Colonel Thomas R. Grisson, U.S.A.F., in Boeing B-52G (eight 13,750 lb.s.t. Pratt and Whitney J57-P-43W), Edwards A.F.B., on December 14, 1960. 10,057·913 mls.

Distance—Straight Line (U.S.A.): Lt.-Colonel K. R. Rea, U.S.A.F., in Boeing KC-135A Stratotanker (four 13,500 lb.s.t. Pratt and Whitney J57-P-43W), Tokyo, Japan, to Lajes, Azores, on April 7–8, 1958. 10,229·383 mls.

Altitude (U.S.S.R.): Colonel Georgy Mosolov, Sov.A.F., in Type "E-66" (one 13,117 lb. TRD RS7F) on April 28, 1961. 112,205 ft.

Absolute Speed—Limited Altitude (U.S.A.): Lt.-Commander James B. Verdin, U.S.N., in Douglas XF4D-1 Skyray (one 11,600 lb.(a/b) Westinghouse XJ40-WE-8), Salton Sea, on October 3, 1953. 753·4 m.p.h.

Absolute Speed—Unlimited Altitude (U.S.A.): Major Joseph W. Rogers, U.S.A.F., in Convair F-106A Delta Dart (one 24,500 lb.(a/b) Pratt and Whitney J75-P-17), Edwards A.F.B., on December 15, 1959. 1,525·93 m.p.h.

Speed round 100-km. (62·137 ml.) Closed Circuit (U.S.A.): Comdr. John F. Davis, U.S.N., in McDonnell F4H-1 Phantom II (two 15,900 lb.(a/b) General Electric J79-GE-2), Edwards A.F.B., on September 25, 1960. 1,390·22 m.p.h.

Speed round 500-km. (310·69 ml.) Closed Circuit (U.S.A.): Lt.-Col. Thomas H. Miller, U.S.M.C., in McDonnell F4H-1 Phantom II (two 15,900 lb.(a/b) General Electric J79-GE-2), Desert–Lone Pine–Beatty Airfield–Desert, on September 5, 1960. 1,216·763 m.p.h.

Speed round 1,000-km. (621·37 ml.) Closed Circuit (France): Commandant René Bigand in G.A.M. Dassault Mirage IV-01 (two 13,230 lb. (a/b) S.N.E.C.M.A. Atar 9B) at Clochers, on September 19, 1960. 1,132·17 m.p.h.

Speed round 2,000-km. (1,242·7 ml.) Closed Circuit (U.S.S.R.): V. Kovaliev in Tupolev Tu-104E (two 20,944 lb.s.t. RD-3M), Sternberg Astronomical Institute–Mielitopol–Sternberg, on April 2, 1960. 596·475 m.p.h.

Speed round 5,000-km. (3,106·9 ml.) Closed Circuit (U.S.A.): Captain C. Griswold, U.S.A.F., in Boeing B-52D Stratofortress (eight 10,500 lb.s.t. Pratt and Whitney J57-P-19), Ellsworth, S. Dakota, on September 26, 1958. 597·681 m.p.h.

Speed round 10,000-km. (6,213·7 ml.) Closed Circuit (U.S.A.): Lt.-Col. Victor L. Sandecz, U.S.A.F., in Boeing B-52D Stratofortress (eight 10,500 lb.s.t. Pratt and Whitney J57-P-19), Ellsworth, S. Dakota, on September 26, 1958. 560·702 m.p.h.

Climb to Altitude (U.S.A.):

3,000 m. (9,842·5 ft.) Lt. E. Enevoldson in F-104A at Point Mugu, Calif., on December 13, 1958. 41·85 seconds

6,000 m. (19,685 ft.) Lt. W. Smith in F-104A at Point Mugu, Calif., on December 13, 1958. 58·41 seconds

9,000 m. (29,527·6 ft.) Lt. W. Smith in F-104A at Point Mugu, Calif., on December 14, 1958. 1 minute 21·14 seconds

12,000 m. (39,370 ft.) Lt. W. Smith in F-104A at Point Mugu, Calif., on December, 14, 1958. 1 minute 39·9 seconds

15,000 m. (49,213 ft.) Lt. E. Enevoldson in F-104A at Point Mugu, Calif., on December 15, 1958. 2 minutes 11·1 seconds

20,000 m. (65,617 ft.) Lt. W. Smith in F-104A at Point Mugu, Calif., on December 14, 1958. 3 minutes 42·99 seconds

25,000 m. (82,021 ft.) Lt. E. Enevoldson in F-104A at Point Mugu, Calif., on December 13, 1958. 4 minutes 26·03 seconds

30,000 m. (98,425 ft.) Lt. J. B. Jordan in F-104C at Edwards A.F.B., on December 14, 1959. 5 minutes 4·92 seconds

RECORDS WITH USEFUL LOAD

1,000 kg. (2,204·62 lb.)

Altitude (U.S.A.): Commander Leroy Heath, U.S.N., in North American A3J-1 Vigilante (two 16,150 lb.(a/b) General Electric J79-GE-4), Edwards A.F.B., on December 13, 1960. 91,451 ft.

Speed over 1,000 km. (U.S.S.R.): Anatoli Lipko in "103M" (four 28,660 lb.(a/b) D-15), Sternberg Astronomical Institute, on October 30, 1959. 639·178 m.p.h.

Speed over 2,000 km. (U.S.S.R.): V. Kovaliev in Tupolev Tu-104E (two 20,944 lb.s.t. RD-3M), Sternberg, on April 2, 1960. 596·472 m.p.h.

Speed over 5,000 km. (U.S.A.): Captain Charles E. Gibbs, U.S.A.F., in Boeing KC-135A Stratotanker (four 13,500 lb.s.t. Pratt and Whitney J57-P-43W), Spokane–Hoquiam–Spokane, on September 17, 1958. 587·134 m.p.h.

2,000 kg. (4,409·2 lb.)

Altitude (U.S.S.R.): Vladimir Smirnov in "RV" (two 8,818 lb.s.t. "37V"), Bykovo, on July 29, 1959. 66,188 ft.

Speed over 1,000 km. (U.S.S.R.): Anatoli Lipko in "103M" (four 28,660 lb.(a/b) D-15), Sternberg Astronomical Institute, on October 30, 1959. 639·178 m.p.h.

Speed over 2,000 km. (U.S.S.R.): V. Kovaliev in Tupolev Tu-104E (two 20,944 lb.s.t. RD-3M), Sternberg, on April 2, 1960. 596·472 m.p.h.

Speed over 5,000 km. (U.S.A.): Captain Charles E. Gibbs, U.S.A.F., in Boeing KC-135A Stratotanker (four 13,500 lb.s.t. Pratt and Whitney J57-P-43W), Spokane–Hoquiam–Spokane, on September 17, 1958. 587·134 m.p.h.

5,000 kg. (11,023·1 lb.)

Altitude (U.S.S.R.): Nicolai Gorainov in "201M" (four 28,660 lb.(a/b) D-15), Podmoskovnoe, on September 16, 1959. 50,253 ft.

Speed over 1,000 km. (U.S.S.R.): Anatoli Lipko in "103M" (four 28,660 lb.(a/b) D-15), Sternberg Astronomical Institute, on October 30, 1959. 639·178 m.p.h.

Speed over 2,000 km. (U.S.S.R.): V. Kovaliev in Tupolev Tu-104E (two 20,944 lb.s.t. RD-3M), Sternberg, on April 2, 1960. 596·472 m.p.h.

Speed over 5,000 km. (U.S.A.): Captain Charles E. Gibbs, U.S.A.F., in Boeing KC-135A Stratotanker (four 13,500 lb.s.t. Pratt and Whitney J57-P-43W), Spokane–Hoquiam–Spokane, on September 17, 1958. 587·134 m.p.h.

10,000 kg. (22,046·2 lb.)

Altitude (U.S.S.R.): Nikolai Gorainov in "201M" (four 28,660 lb.(a/b) D-15), Podmoskovnoe, on September 16, 1959. 50,253 ft.

Speed over 1,000 km. (U.S.S.R.): Anatoli Lipko in "103M" (four 28,660 lb.(a/b) D-15), Sternberg Astronomical Institute, on October 30, 1959. 639·178 m.p.h.

Speed over 2,000 km. (U.S.S.R.): V. Kovaliev in Tupolev Tu-104E (two 20,944 lb.s.t. RD-3M), Sternberg, on April 2, 1960. 596·472 m.p.h.

Speed over 5,000 km. (U.S.A.): Captain Charles E. Gibbs, U.S.A.F., in Boeing KC-135A Stratotanker (four 13,500 lb.s.t. Pratt and Whitney J57-P-43W), Spokane–Hoquiam–Spokane, on September 17, 1958. 587·134 m.p.h.

20,000 kg. (44,092 lb.)

Altitude (U.S.S.R.): Boris Stepanov in "201M" (four 28,660 lb. (a/b) D-15), Podmoskovnoe, on October 29, 1959. 43,048 ft.

Speed over 1,000 km. (U.S.S.R.): Anatoli Lipko in "103M" (four 28,660 lb.(a/b) D-15), Sternberg Astronomical Institute, on October 30, 1959. 639·178 m.p.h.

25,000 kg. (55,116 lb.)

Speed round 1,000-km. Closed Circuit (U.S.S.R.): Ivan Soukhomline in Tu-114 (four 12,000 s.h.p. TV-12 turboprops), Sternberg, on March 24, 1960. 541·447 m.p.h.

Speed round 2,000-km. Closed Circuit (U.S.S.R.): Ivan Soukhomline in Tu-114 (four 12,000 s.h.p. TV-12 turboprops), Sternberg, on April 1, 1960. 532·69 m.p.h.

Speed round 5,000-km. Closed Circuit (U.S.S.R.): Ivan Soukhomline in Tu-114 (four 12,000 s.h.p. TV-12 turboprops), Sternberg–Sverdlovsk–Sebastopol–Sternberg, on April 9, 1960. 545·07 m.p.h.

30,000 kg. (66,139 lb.)

Altitude (U.S.S.R.): Boris Stepanov in " 103M " (four 28,660 lb. (a/b) D-15), Podmoskovnoe, on October 29, 1959. 43,048 ft.

40,000 kg. (88,185 lb.)

Altitude (U.S.S.R.): Boris Stepanov in " 103M " (four 28,660 lb. (a/b) D-15), Podmoskovnoe, on October 29, 1959. 43,048 lb.

55,000 kg. (121,254 lb.)

Altitude (U.S.S.R.): Boris Stepanov in " 201M " (four 28,660 lb. (a/b) D-15), Podmoskovnoe, on October 29, 1959. 43,084 ft.

Greatest Load carried to 2,000 m. (U.S.S.R.): Boris Stepanov in " 201M " (four 28,660 lb.(a/b) D-15), Podmoskovnoe, on October 29, 1959. 121,739 lb.

Light Jet Aircraft Sub-Class C-1-c

(Aircraft weighing 1,000–1,750 kg.—2,204·6–3,758·9 lb.)

Speed (Yugoslavia): Ivan Crnjaric in Type 451M Zolja (two 330 lb. Turboméca Palas), Zemun–Stara–Pazova, at 2,686·22 lb. on May 19, 1960. 310·82 m.p.h.

(Aircraft weighing 1,750–3000 kg.—3,758·9–6,613·9 lb.)

Altitude (U.S.S.R.): Valentine Moukhine in Yakovlev Yak-32 (one Fumanskii turbojet), at 4,710 lb., on February 22, 1961. 47,080 ft.

Speed (Yugoslavia): Ljubomir Zekavica in Type 451MM, Matica (two 882 lb. Turboméca Marboré II), Zemun–Stara–Pazova, at 4,956 lb., on May 19, 1960. 446·24 m.p.h.

GROUP II

Distance in a Closed Circuit (U.S.A.): Lt.-Col. Lassiter in Boeing B-29 Superfortress (four 2,200 h.p. Wright R-3350-57A), McDill Field, Florida, on August 1–3, 1947. 8,854·13 mls.

Distance in a Straight Line (U.S.A.): Commander Thomas D. Davies in a Lockheed P2V-1 Neptune (two 2,300 h.p. Wright R-3350), Perth–Columbus, Ohio, on September 29–October 1, 1946. 11,235·946 mls.

Altitude (Italy): Mario Pezzi in a Caproni Ca.161bis (one Piaggio XI R.C), Montecelio, on October 22, 1938. 56,046 ft.

Absolute Speed—Limited Altitude (Germany): Flugkapitan Fritz Wendel in Messerschmitt Me 209V1 (one 2,300 h.p. Daimler-Benz DB 601R), Augsburg, on April 26, 1939. 469·22 m.p.h.

Absolute Speed—Unlimited Altitude (U.S.A.): Miss J. Cochran in North American F-51 Mustang (1,450 h.p. Rolls-Royce Merlin), Indio, Calif., on April 9, 1951. 464·37 m.p.h.

Speed over 100 km. (U.S.A.): Miss J. Cochran in North American F-51 Mustang (1,450 h.p. Rolls-Royce Merlin), Coachella Valley, Calif., on December 10, 1947. 469·565 m.p.h.

Speed over 500 km. (U.S.A.): Miss J. Cochran in North American F-51 Mustang (1,450 h.p. Rolls-Royce Merlin), Desert Center–Mount Wilson, on December 29, 1949. 437·06 m.p.h.

Speed over 1,000 km. (U.S.A.): Miss J. Cochran in North American F-51 Mustang (1,450 h.p. Rolls-Royce Merlin), Santa Rosa Summit, Calif.–Flagstaff, Arizona, on May 24, 1948. 431·098 m.p.h.

Speed over 2,000 km. (U.S.A.): Miss J. Cochran in North American F-51 Mustang (1,450 h.p. Rolls-Royce Merlin), Santa Rosa Summit, California, to Santa Fe, New Mexico, on May 22, 1948. 447·47 m.p.h.

Speed over 5,000 km. (U.S.A.): Capt. James Bauer in Boeing B-29 Superfortress (four 2,200 h.p. Wright R-3350-23A), Dayton, Ohio, on June 28, 1946. 338·39 m.p.h.

Speed over 10,000 km. (U.S.A.): Lt.-Col. O. F. Lassiter in Boeing B-29 Superfortress (four 2,200 h.p. Wright R-3350-23A), Dayton, Ohio, on July 29–30, 1947. 273·192 m.p.h.

WORLD AIRCRAFT DIRECTORY GUIDE

THE aircraft illustrated and described within the pages that follow are arranged in broad structural groups in order to aid identification. Within these groups the aircraft are listed in alphabetical order of manufacturers' names. Flying boats (all aircraft with planing bottoms, including amphibians) are not included in the structural groups, being grouped separately on pages 262–266.

Non-swept Wing—Integral Jet(s) 189
All jet aircraft other than those of delta wing planform without any marked sweepback on the wing trailing edges and with one or more turbojets housed within the fuselage, attached to the fuselage sides, or buried within the wings.

Non-swept Wing—Wing-mounted Jets . . . 200
All jet aircraft other than those of delta wing planform without any marked sweepback on the wing trailing edges and with two or more turbojets mounted beneath the wings in nacelles or pods, or mounted centrally within the wing but protruding above and below the wing surfaces and ahead of the wing leading edges (e.g. the Canberra).

Swept Wing—Integral Jet(s) 204
All jet aircraft other than those of delta wing planform with marked sweepback (i.e. more than five degrees) on the wing trailing edges and with one or more turbojets housed within the fuselage, attached to the fuselage sides, or buried within the wings.

Swept Wing—Underwing Jets 223
All swept wing aircraft with two or more turbojets mounted beneath the wings in nacelles or pods.

Swept Wing—Rear External Jets 230
Swept wing aircraft with turbojets mounted externally on the rear fuselage sides.

Delta Wing 231
All aircraft with wings of approximately triangular planform, so-called from the Greek letter Δ (delta).

Twin-tailboom—Jet(s) 237
All turbojet-driven aircraft in which the main body takes the form of a central nacelle, the tail assembly being carried by two slim booms.

Twin-tailboom—Prop(s) 240
All piston-engined or turboprop-driven aircraft in which the main body takes the form of a central nacelle, the tail assembly being carried by two slim booms.

Four-prop—High Wing 242
All aircraft with four propellers, either piston-engined or turboprop-powered, with high-mounted wings (i.e. attached at the top of the fuselage).

Four-prop—Low Wing 245
All aircraft with four propellers, either piston-engined or turboprop-powered, with mid- or low-set wings.

Tri-motor 261
All three-engined airscrew-driven aircraft.

Flying Boats 262
All aircraft with planing hulls, including amphibians.

Two-prop—High Wing 267
All aircraft with two propellers, either piston-engined or turboprop-powered, with high-mounted wings.

Two-prop—Low Wing 275
All aircraft with two propellers and mid- or low-set wings.

Biplane—Two-prop 299
Twin-engined biplanes (aircraft with two sets of mainplanes, one mounted above the other).

Biplane—Single-prop 300
Single-engined biplanes.

Single-prop—Low-Wing (Retractable u/c) . . . 304
All aircraft with a single propeller and a mid- or low-mounted wing and retractable main undercarriage members.

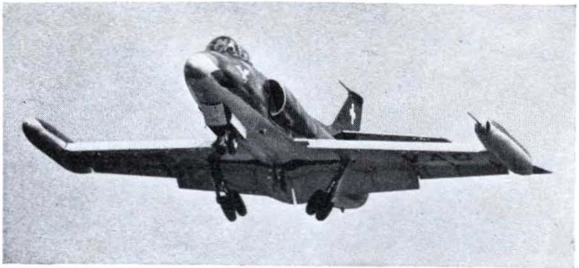
Single-prop—Low Wing (Fixed u/c) 320
All aircraft with a single propeller and a mid- or low-mounted wing and fixed main undercarriage members.

Single-prop—High Wing 335
All aircraft with a single propeller and a parasol or high-mounted wing.

A.F.A. P-16 MK. III

Originally designed to meet a Swiss Air Force specification, the P-16 suffered several accidents during its initial trials and an order for 100 machines for the Swiss Air Force was cancelled. Five prototypes have been built, and development is being continued by the A.F.A. as a private venture.

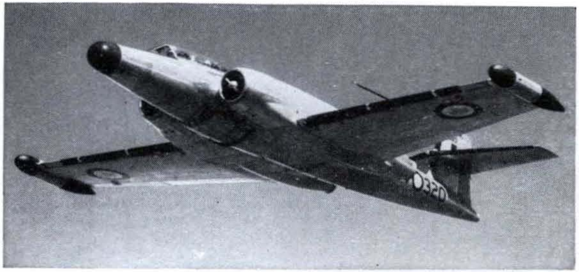
Nationality: Swiss. **Type:** Single-seat Strike Fighter. **Power Plant:** One 11,000 lb.s.t. Bristol Siddeley Sapphire A.S.Sa.7 turbojet. **Armament:** Two 30-mm. cannon and forty-four 68-mm. rockets plus up to 4,940 lb. external ordnance. **Weights:** Empty, 15,500 lb.; normal loaded, 20,475 lb.; max., 25,800 lb. **Performance:** Max. speed, 627 m.p.h. at 30,000 ft. (Mach 0·93); initial climb, 12,786 ft./min. **Dimensions:** Span, 36 ft. 6½ in.; length, 46 ft. 8¾ in.; height, 13 ft. 5 in.; wing area, 323 sq. ft.



AVRO CF-100 MK. 4B

Currently serving with four R.C.A.F. squadrons based in Europe, the CF-100 Mk. 4B will be withdrawn from service in 1962. The initial production CF-100 Mk. 4A had 6,500 lb.s.t. Orenda 9 turbojets and was the first model fitted with APG-40 radar. Production was completed in 1956 with the 510th CF-100 Mk. 4.

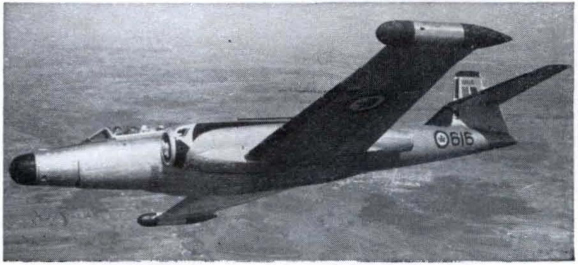
Nationality: Canadian. **Type:** Two-seat All-weather Fighter. **Power Plants:** Two 7,275 lb.s.t. Orenda 11 turbojets. **Armament:** Eight 0·5-in. guns and (wingtip pods) 104 2·75-in. rockets. **Weights:** Empty, 24,408 lb.; normal loaded, 35,500 lb. **Performance:** Max. speed, 650 m.p.h. at 10,000 ft. (Mach 0·89); initial climb, 8,000 ft./min.; ceiling, 50,000 ft.; combat radius (standard tankage), 650 mls. **Dimensions:** Span, 53 ft. 7 in.; length, 54 ft. 2 in.; height, 14 ft. 6 in.; wing area, 540 sq. ft.

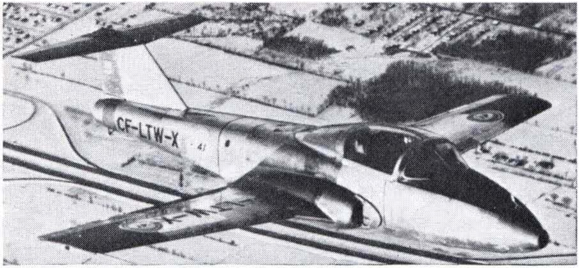


AVRO CF-100 MK. 5

Equipping nine home-based R.C.A.F. squadrons and two Belgian squadrons, the CF-100 Mk. 5 is lighter than its predecessor and has increased wing span to improve altitude performance. Fifty-three were supplied to Belgium but most R.C.A.F. fighters of this type were Mk. 4Bs brought up to the later standards.

Nationality: Canadian. **Type:** Two-seat All-weather Fighter. **Power Plants:** Two 7,272 lb.s.t. Orenda 11 turbojets. **Armament:** One hundred and four 2·75-in. rockets in wingtip pods. **Weights:** Empty, 23,100 lb.; normal loaded, 33,600 lb.; max., 36,000 lb. **Performance:** Max. speed, 650 m.p.h. at 10,000 ft. (Mach 0·89); initial climb, 8,500 ft./min.; ceiling, 54,000 ft.; range (max. fuel), 2,000+ mls. **Dimensions:** Span, 60 ft. 10 in.; length, 54 ft. 2 in.; height, 14 ft. 6 in.; wing area, 591 sq. ft.

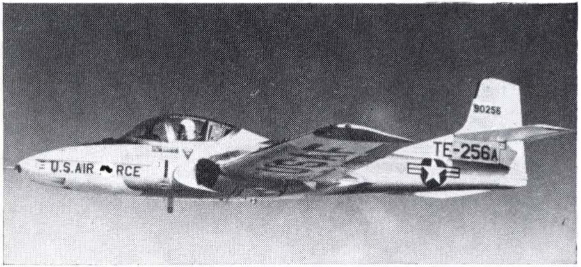




CANADAIR CL-41

Built as a private venture and potential successor to the CL-30 Silver Star, the CL-41 flew initially on January 13, 1960, and the two prototypes have been evaluated by the R.C.A.F., but no production order has yet been announced. The CL-41 can carry 1,000 lb. of practice bombs, rockets or gun pods underwing.

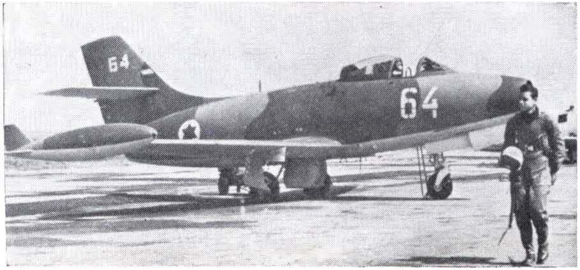
Nationality: Canadian. **Type:** Two-seat Basic Trainer. **Power Plant:** One 2,400 lb.s.t. Pratt and Whitney JT12A-2 turbojet. **Weight:** Normal loaded, 6,500 lb. **Performance:** Max. speed, 474 m.p.h. at 30,000 ft., 443 m.p.h. at sea level; initial climb, 4,100 ft./min.; service ceiling, 44,500 ft.; max. range (standard tankage), 921 mls. at 358 m.p.h. at 38,000 ft. **Dimensions:** Span, 36 ft. 4 in.; length, 32 ft.; height, 9 ft. 4½ in.; wing area, 220 sq. ft.



CESSNA T-37B

Standard U.S.A.F. intermediate trainer and adopted by the Peruvian Air Force, the T-37B is a more powerful development of the T-37A which had 920 lb.s.t. J69-T-9 turbojets. All T-37As had been converted to T-37B standards by mid-1960, and production was scheduled to be phased out in mid-1961.

Nationality: American. **Type:** Two-seat Intermediate Trainer. **Power Plants:** Two 1,025 lb.s.t. Continental J69-T-25 turbojets. **Weights:** Empty, 4,056 lb.; loaded, 6,574 lb. **Performance:** Max. speed, 425 m.p.h. at 20,000 ft.; normal range, 869 mls. at 360 m.p.h. at 35,000 ft., max., 931 mls. at 333 m.p.h. at 35,000 ft.; initial climb, 3,370 ft./min.; service ceiling, 38,700 ft.; single-engine ceiling, 25,000 ft. **Dimensions:** Span, 33 ft. 10 in.; length, 29 ft. 3 in.; height, 9 ft. 2 in.; wing area 183·9 sq. ft.



DASSAULT MD-450 OURAGAN

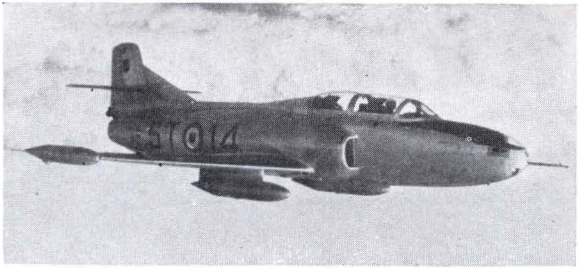
The first French jet fighter of national design to be manufactured in quantity, the Ouragan currently serves with the air arms of Israel and India which have received some seventy-five and 104 machines respectively. Known in the Indian Air Force as the Toofani, the Ouragan no longer serves with French squadrons.

Nationality: French. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,070 lb.s.t. Hispano-Suiza Nene 104B turbojet. **Armament:** Four 20-mm. Hispano 404 Model 50 cannon and a 2,220-lb. external ordnance load. **Weights:** Empty, 9,131 lb.; loaded, 14,991 lb. **Performance:** Max. speed, 584 m.p.h. at sea level; initial climb, 7,874 ft./min.; service ceiling, 49,200 ft. **Dimensions:** Span, 40 ft. 3½ in.; length, 35 ft. 2¼ in.; height, 13 ft.; wing area, 256·18 sq. ft.

FIAT G.82-1B

Derived from the Goblin-powered G.80-1B, Italy's first post-war jet aircraft, the G.82-1B was flown with a Nene R.N.2/21 engine of 5,000 lb.s.t. in 1954, and a small number of aircraft with the more powerful Nene R.N.6/21 have been delivered to Italian advanced training elements.

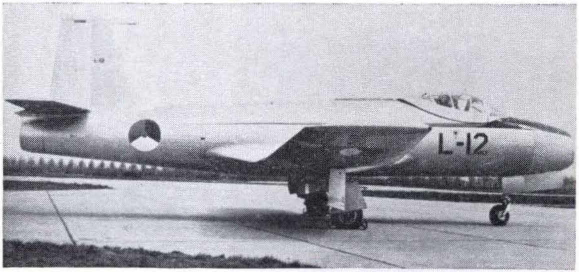
Nationality: Italian. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 5,400 lb.s.t. Rolls-Royce Nene R.N.6/21 turbojet. **Armament:** Two 0·5-in. machine guns. **Weights:** Empty, 9,700 lb.; loaded, 13,780 lb.; max., 15,430 lb. **Performance:** Max. speed, 576 m.p.h. at sea level; cruising, 360 m.p.h. at 29,530 ft.; range (standard tankage), 714 mls.; service ceiling, 42,600 ft. **Dimensions:** Span, 38 ft. 1 in.; length, 42 ft. 5 in.; height, 13 ft. 4 in.; wing area, 270·6 sq. ft.



FOKKER S.14 MACH-TRAINER

The Mach-Trainer was the first jet aircraft to be designed from the outset for the training rôle, and twenty aircraft of this type have been delivered to the R.Neth.A.F. The Mach-Trainer flew on May 20, 1951, and production was completed late in 1955. Plans to produce the S.14 in Brazil did not materialise.

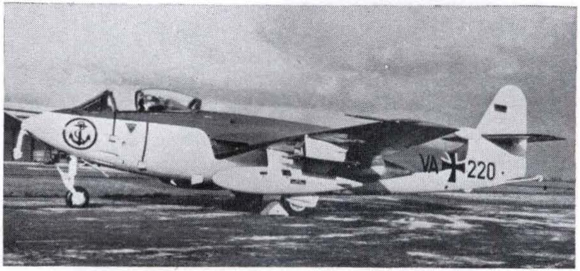
Nationality: Dutch. **Type:** Two-seat Conversion Trainer. **Power Plant:** One 3,470 lb.s.t. F.N.A.-Rolls-Royce Derwent 8 turbojet. **Weights:** Empty, 8,304 lb.; loaded, 11,800 lb. **Performance:** Max. speed, 445 m.p.h. at 20,000 ft.; cruising, 366 m.p.h. at 30,000 ft.; initial climb, 3,200 ft./min.; service ceiling, 36,500 ft.; endurance, 1·85 hrs . at 300 m.p.h.; range, 600 mls. at 355 m.p.h. at 29,520 ft. **Dimensions:** Span, 39 ft. 5 in.; length, 43 ft. 8 in.; height, 15 ft. 4 in.; wing area, 342 sq. ft.

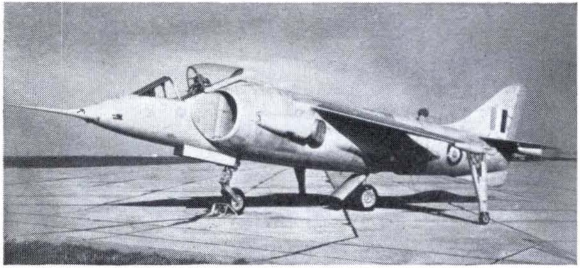


HAWKER SEA HAWK MK. 100

Basically similar to the Sea Hawk F.G.A.6, the last first-line Royal Navy squadron of which was disbanded in December 1960, the Mk. 100 strike fighter serves with the German Navy. Sixty-eight were purchased by Germany of which thirty-four were Mk. 101s with Ekco radar under the starboard wing.

Nationality: British. **Type:** Single-seat Shipboard Strike Fighter. **Power Plant:** One 5,400 lb.s.t. Rolls-Royce Nene 103 turbojet. **Armament:** Four 20-mm. cannon, two 500-lb. bombs and ten 3-in. or eight 5-in. rockets. **Weights:** Normal loaded, 13,200 lb.; max., 16,200 lb. **Performance:** Max. speed, 599 m.p.h. at sea level (Mach 0·79); initial climb, 5,700 ft./min.; radius (standard tankage), 230 mls. **Dimensions:** Span, 39 ft.; length, 40 ft. $3\frac{1}{2}$ in.; height, 9 ft. $9\frac{1}{2}$ ins.; wing area, 278 sq. ft.

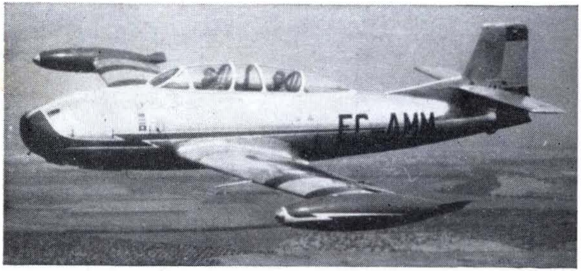




HAWKER P.1127

The world's first V./S.T.O.L. strike aircraft, the Hawker P.1127 began trials in October 1960, and an evaluation batch has been ordered. Two pairs of exhaust nozzles revolve to direct the flow aft to give thrust, downwards to give lift or to intermediate positions to give combinations of thrust and lift. Weapons can be carried on a centreline pylon and under the wings, and S.T.O.L. techniques will be employed rather than V.T.O.L. techniques when any substantial warload is carried.

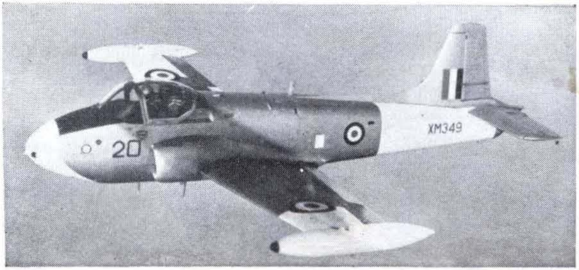
Nationality: British. **Type:** Single-seat Tactical Strike Fighter. **Power Plant:** One 15,000 lb.s.t. Bristol-Siddeley Pegasus turbojet. **Performance:** Approx. max. speed, 725 m.p.h. at sea level (Mach 0·95). **Dimensions:** Span, 24 ft. 4 in.; length, 41 ft. 2 in.; height, 10 ft. 3 in.



HISPANO HA-200R-1 SAETA

The first turbojet-driven aircraft of Spanish origin, the Saeta first flew on August 16, 1955, and an initial series of forty machines is being built for the Spanish Air Force. It is also being assembled in Egypt under the name *Al Kahira* (The Cairo), and the Spanish Air Force's designation is E-14.

Nationality: Spanish. **Type:** Two-seat Advanced Trainer. **Power Plants:** Two 880 lb.s.t. Turboméca Marboré IIA turbojets. **Weights:** Empty, 3,697 lb.; normal loaded, 5,820 lb. **Performance:** Max. speed, 435 m.p.h. at 22,966 ft., 405 m.p.h. at sea level; initial climb, 3,345 ft./min.; service ceiling, 39,360 ft.; range (standard tankage), 557 mls. at 29,528 ft., (with two 53 Imp. gal. tip tanks), 1,056 mls. **Dimensions:** Span, 34 ft. $2\frac{1}{4}$ in.; length, 29 ft. $1\frac{1}{2}$ in.; height, 10 ft. 8 in.; wing area, 187·2 sq. ft.



HUNTING JET PROVOST T.3

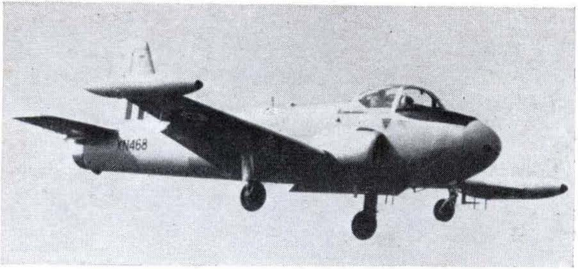
The Jet Provost T.3 entered service with the R.A.F. in mid-1959, and an armed version, the Jet Provost T.51, has been supplied to the Royal Ceylon Air Force. Service trials with the original Jet Provost T.1 began at the C.F.S. in July 1955, this version having the 1,640 lb.s.t. Viper 101 turbojet.

Nationality: British. **Type:** Two-seat Basic Trainer. **Power Plant:** One 1,750 lb.s.t. Bristol Siddeley Viper 102 turbojet. **Weights:** Empty 4,347 lb.; normal loaded, 6,195 lb.; max., 6,830 lb. **Performance:** Max. speed, 330 m.p.h. at 30,000 ft., 311 m.p.h. at 10,000 ft.; cruising speed, 273 m.p.h. at 30,000 ft.; initial climb, 2,400 ft./min.; ceiling, 35,000 ft.; range, 345 mls. at 264 m.p.h. at 30,000 ft. **Dimensions:** Span, 36 ft. 11 in.; length, 32 ft. 5 in.; height, 10 ft. 2 in.; wing area, 213·7 sq. ft.

HUNTING JET PROVOST T.4

Evolved from the earlier Jet Provost T.3 as a private venture, the Jet Provost T.4 is currently being supplied to the R.A.F. to supplement the earlier model. The more powerful turbojet allows the scope of the basic flying training syllabus to be extended far beyond the stage practicable with the T.3.

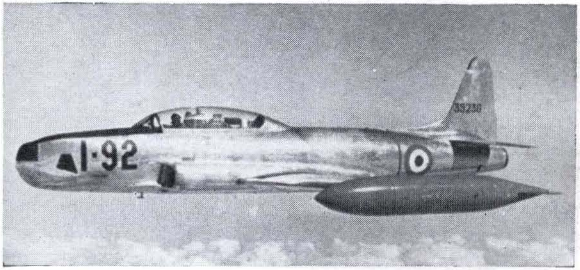
Nationality: British. **Type:** Two-seat Basic Trainer. **Power Plant:** One 2,500 lb.s.t. Bristol Siddeley Viper 200 turbojet. **Weights:** Empty, 4,707 lb.; max. loaded, 7,200 lb. **Performance:** Max. speed, 409 m.p.h. at 30,000 ft., 394 m.p.h. at 10,000 ft., 380 m.p.h. at sea level; range, 599 mls. at 20,000 ft., 691 mls. at 30,000 ft.; initial climb, 3,340 ft./min.; time to 20,000 ft., 7·25 min. **Dimensions:** Span, 36 ft. 11 in.; length, 32 ft. 5 in.; height, 10 ft. 2 in.; wing area, 213·7 sq. ft.



LOCKHEED RT-33A

Serving in small numbers with several N.A.T.O. air forces, the RT-33A is a single-seat photographic version of the T-33A trainer, carrying a battery of four mapping and charting cameras and a wire recorder. The recorder enables the pilot to comment on particular features of the terrain, etc.

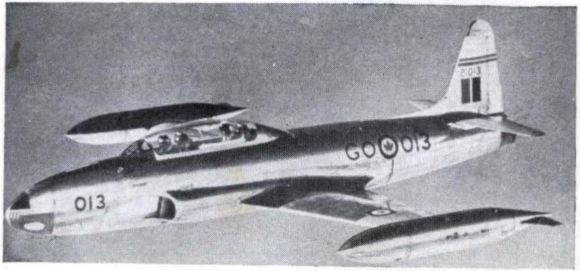
Nationality: American. **Type:** Single-seat Reconnaissance Aircraft. **Power Plant:** One 5,400 lb.s.t. Allison J33-A-35 turbojet. **Weight:** Loaded, 14,320 lb. **Performance:** Max. speed, 581 m.p.h. at sea level, 538 m.p.h. at 25,000 ft.; cruising speed, 432 m.p.h. at 30,000 ft.; initial climb, 5,640 ft./min.; range (standard tankage), 680 mls.; max., 1,267 mls.; ceiling, 47,500 ft. **Dimensions:** Span, 38 ft. 10½ in.; length, 37 ft. 9 in.; height, 11 ft. 8 in.; wing area, 237 sq. ft.

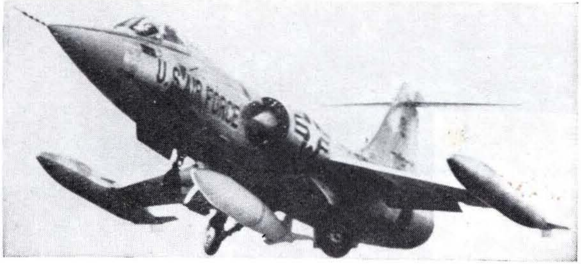


LOCKHEED T-33A

When the last T-33A was delivered in August 1959, a total of 5,691 trainers of this type had been produced by the parent company. In addition, 656 were built by Canadair as the CL-30 Silver Star (T-33A-N), the Mks. 2 and 3 versions of which had the 5,100 lb.s.t. Nene, and a further 210 by Kawasaki. The U.S. Navy version of the T-33A is designated TV-2.

Nationality: American. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 5,400 lb.s.t. Allison J33-A-35 turbojet. **Weights:** Empty, 8,084 lb.; loaded, 11,965 lb.; max., 14,442 lb. **Performance:** Max. speed, 600 m.p.h. at sea level (Mach 0·787), 543 m.p.h. at 25,000 ft.; initial climb, 5,525 ft./min.; range, 565 mls., max., 1,345 mls. **Dimensions:** Span, 38 ft. 10½ in.; length, 37 ft. 9 in.; height, 11 ft. 8 in.; wing area, 237 sq. ft.

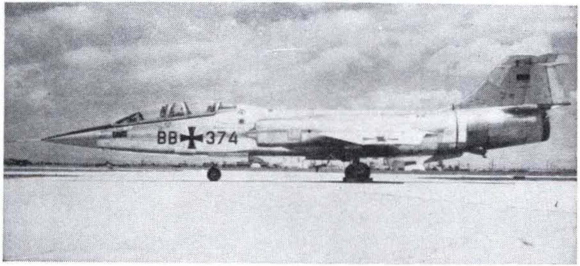




LOCKHEED F-104C STARFIGHTER

Equipping one tactical fighter wing of the U.S.A.F. Tactical Air Command, the F-104C is the only single-seat version of the Starfighter serving with the U.S.A.F. One hundred and eighty basically similar aircraft with the J79-GE-11 are to be manufactured in Japan under the designation F-104C-J.

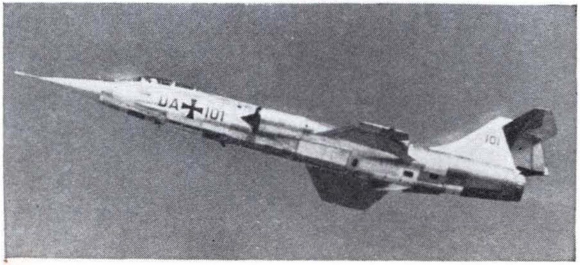
Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 10,000 lb.s.t. (15,800 lb.s.t. with afterburning) General Electric J79-GE-7 turbojet. **Armament:** One 20-mm. rotary cannon and two or four Sidewinder missiles. **Weights:** Loaded, 20,500 lb.; max., 23,590 lb. **Performance:** Max. speed, 1,450 m.p.h. at 40,000 ft. (Mach 2·2); max. climb, 40,000 ft./min. **Dimensions:** Span, 21 ft. 11 in.; length, 54 ft. 9 in.; height, 13 ft. 6 in.; wing area, 179 sq. ft.



LOCKHEED F-104F STARFIGHTER

The two-seat F-104F, thirty of which have been supplied to Germany, is basically similar to the F-104D (two-seat version of the F-104C) but has similar equipment to the F-104G. Twenty-seven of the German F-104Fs are to equip a fighter-bomber squadron pending the availability of sufficient F-104Gs.

Nationality: American. **Type:** Two-seat Multi-purpose Combat-proficiency Trainer. **Power Plant:** One 10,000 lb.s.t. (15,800 lb.s.t. with afterburning) General Electric J79-GE-7 turbojet. **Armament:** Two or four Sidewinder missiles and (optional) one 20-mm. rotary cannon. **Weight:** Approx. normal loaded, 21,000 lb. **Performance:** Maximum speed, 1,320 m.p.h. at 40,000 ft. (Mach 2·0); max. climb rate, 40,000 ft./min. **Dimensions:** Similar to those of the F-104C.



LOCKHEED F-104G SUPER STARFIGHTER

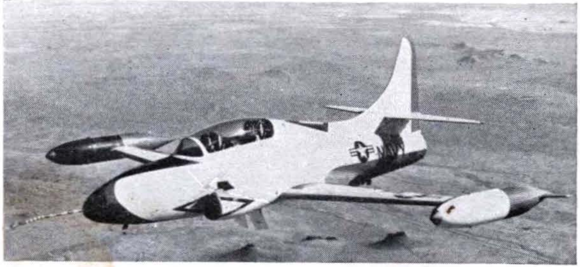
Adopted as standard equipment by the West German, Belgian, Dutch and Italian air forces, the F-104G is being built by the parent company and aircraft manufacturers in Germany, Belgium, the Netherlands and Italy. Germany is receiving 700 F-104Gs (including ninety-six built by Lockheed), Italy is receiving 125, and Belgium and the Netherlands are receiving 100 and 125.

Nationality: American. **Type:** Single-seat Strike Fighter and Interceptor. **Power Plant:** One 10,350 lb.s.t. (16,150 lb.s.t. with afterburning) General Electric J79-GE-11A turbojet. **Armament:** One (optional) 20-mm. rotary cannon and up to 4,000 lb. external ordnance. **Weights:** Normal loaded, 20,900 lb.; max., 27,000 lb. **Performance:** Max. speed, 1,450 m.p.h. (Mach 2·2). **Dimensions:** As for those of the F-104C.

LOCKHEED T2V-1 SEASTAR

Derived from the T-33A as a naval all-purpose trainer, the T2V-1 features blown flaps to improve low-speed characteristics. Production deliveries commenced during 1957, and 271 T2V-1s had been delivered when production terminated in 1958. The T2V-1 is assigned to pilot training in sea-going carriers.

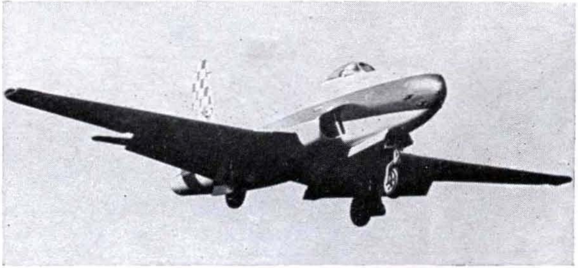
Nationality: American. **Type:** Two-seat Multi-purpose Shipboard Trainer. **Power Plant:** One 6,100 lb.s.t. Allison J33-A-24 turbojet. **Weights:** Empty, 11,965 lb.; normal loaded, 15,500 lb.; max., 16,800 lb. **Performance:** Max. speed, 580 m.p.h. at 35,000 ft.; initial climb (at 15,500 lb.), 6,330 ft./min., (at 16,800 lb.), 5,400 ft./min.; service ceiling, 40,000 ft.; max. range, 967 mls. **Dimensions:** Span, 42 ft. 10 in.; length, 38 ft. 6½ in.; height, 13 ft. 4 in.



LOCKHEED F-80C SHOOTING STAR

Serving with the air forces of Chile, Peru and Uruguay, the F-80C was the final single-seat production model of the Shooting Star, the first U.S. jet fighter to be mass-produced. A total of 917 F-80A Shooting Stars—240 of which were modified as F-80Bs—was followed by 798 examples of the F-80C.

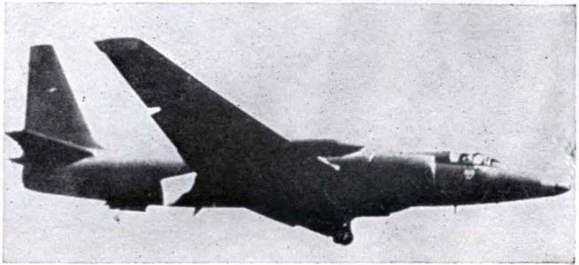
Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,400 lb.s.t. Allison J33-A-35 turbojet. **Armament:** Six 0·5-in. machine guns and two 1,000-lb. bombs. **Weights:** Empty, 8,240 lb.; loaded, 15,336 lb. **Performance:** Max. speed, 594 m.p.h. at sea level, 543 m.p.h. at 25,000 ft.; time to 25,000 ft., 7 min.; ceiling, 44,100 ft.; max. endurance, 3·2 hrs. **Dimensions:** Span, 38 ft. 10½ in.; length, 34 ft. 6 in.; height, 11 ft. 4 in.; wing area, 237 sq. ft.

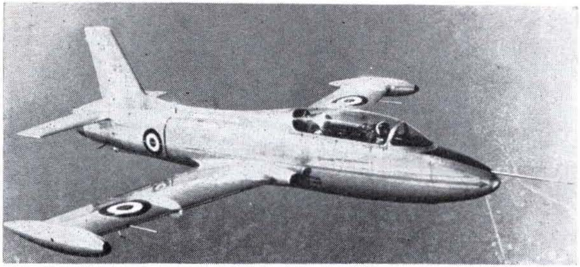


LOCKHEED U-2

Reputedly developed at the request of the Central Intelligence Agency as an aircraft capable of penetrating far into the Soviet Union at altitudes rendering it immune from interception, the U-2 was built with both the J57C and the J75-P-13, attaining altitudes of the order of 90,000 ft. with the latter. Also used for research, some twenty-five U-2 aircraft were built.

Nationality: American. **Type:** Single-seat Electronic and Photo Reconnaissance and Research Aircraft. **Power Plant:** One 11,000 lb.s.t. Pratt and Whitney J57C turbojet. **Weights:** Loaded, 15,850 lb.; max., 17,270 lb. **Performance:** Max. speed 495 m.p.h. at 40,000 ft. (Mach 0·75); cruising, 460 m.p.h.; range (standard tankage), 2,200 mls., (with two 87 Imp. gal. tanks), 2,600 mls. **Dimensions:** Span, 80 ft.; length, 49 ft. 7 in.

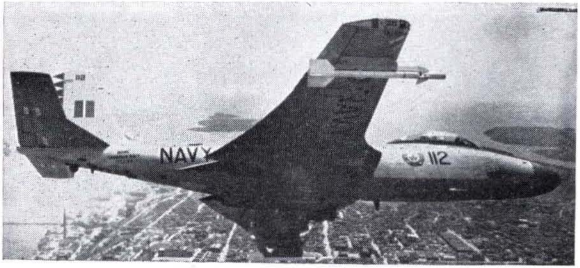




MACCHI M.B.326

The M.B.326 has been designed to meet a requirement formulated by the Italian Air Force, the first of two prototypes flying on December 10, 1957, and the first deliveries to the Italian Air Force taking place early in 1961. Only thirty-one M.B.326 trainers had been ordered at the time of closing for press but it is expected that some 120 will be required.

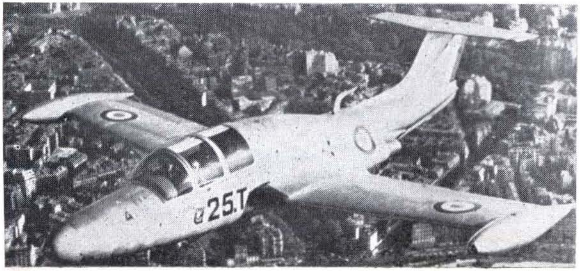
Nationality: Italian. **Type:** Two-seat Basic Trainer. **Power Plant:** One 2,460 lb.s.t. Bristol Siddeley Viper A.S.V.11 turbojet. **Weights:** Empty, 5,027 lb.; loaded, 7,430 lb. **Performance:** Max. speed, 507 m.p.h. at 20,000 ft., 495 m.p.h. at 40,000 ft.; cruising, 348 m.p.h. at 30,000 ft.; range, 690 mls.; initial climb, 4,420 ft./min. **Dimensions:** Span, 32 ft. 11 in.; length, 34 ft. 11¾ in.; height, 11 ft. 7⅓ in.; wing area, 204·52 sq. ft.



MCDONNELL F2H-3 BANSHEE

Serving with VF 870 aboard the Canadian Navy's carrier, the *Bonaventure*, thirty-nine F2H-3 Banshees were acquired from U.S. Navy squadron establishments in 1955. No longer in service with the U.S. Navy, the Canadian Navy's Banshees were modified to carry two Sidewinders in the Autumn of 1958.

Nationality: American. **Type:** Single-seat Shipboard All-weather Fighter. **Power Plants:** Two 3,350 lb.s.t. Westinghouse J34-WE-34 turbojets. **Armament:** Four 20-mm. cannon and two Sidewinder missiles. **Weight:** Approx. loaded, 19,000 lb. **Performance:** Max. speed, 590 m.p.h. at sea level, 575 m.p.h. at 20,000 ft.; initial climb, 6,000 ft./min.; service ceiling, 40,000 ft.; radius, 800 mls.; ferry range, 2,250 mls. **Dimensions:** Span, 44 ft. 11 in.; length, 47 ft. 6 in.; height, 14 ft. 5½ in.



MORANE-SAULNIER M.S.760 PARIS

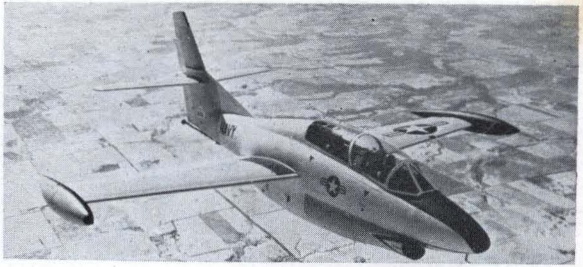
First flown on July 29, 1954, the Paris serves with the Armée de l'Air and the Aéronavale, these services having received thirty-one and nineteen aircraft respectively. The Paris has been exported to ten countries, forty-eight have been assembled in Argentina, and production totalled some 120 machines by mid-1961.

Nationality: French. **Type:** Four-seat Liaison or Two-seat Training Aircraft. **Power Plants:** Two 880 lb.s.t. Turboméca Marboré II turbojets. **Armament:** (Optional) Two or four 7·62-mm. guns. **Weights:** Empty, 4,280 lb.; loaded, 7,650 lb. **Performance:** Max. speed, 405 m.p.h. at sea level, 345 m.p.h. at 23,000 ft.; cruising, 350 m.p.h. at 16,400 ft.; initial climb, 2,264 ft./min.; range, 930 mls. **Dimensions:** Span, 33 ft. 3 in.; length, 32 ft. 10¾ in.; height, 8 ft 6 in.; wing area, 193·68 sq. ft.

NORTH AMERICAN T2J-1 BUCKEYE

Employing a basically similar wing to that of the FJ-1 Fury jet fighter and the basic control system of the T-28C, the first T2J-1 Buckeye flew on February 10, 1958, and the 217th and last machine was completed in January 1961. The Buckeye undertakes a wide range of training rôles.

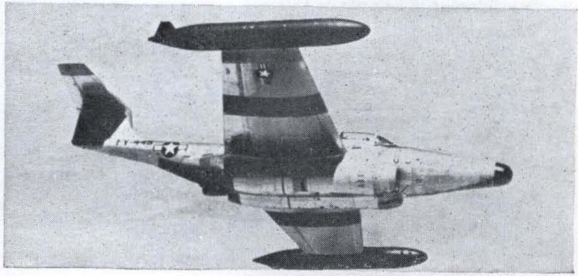
Nationality: American. **Type:** Two-seat Shipboard General-purpose Trainer. **Power Plant:** One 3,400 lb.s.t. Westinghouse J34-WE-36 turbojet. **Armament:** Two 0·5-in. guns plus two 100-lb. practice bombs or 2·75-in. rocket packs. **Weights:** Empty, 6,893 lb.; normal loaded, 9,916 lb.; max., 11,373 lb. **Performance:** Max. speed, 492 m.p.h. at 25,000 ft.; range, 550 mls.; initial climb, 5,000 ft./min. **Dimensions:** Span, 36 ft.; length, 38 ft. 8 in.; height, 14 ft. 9 in.; wing area, 255 sq. ft.



NORTHROP F-89J SCORPION

Currently being phased out of service with the U.S. Air National Guard, the F-89J became operational in January 1957, 350 F-89Ds being converted to " J " standards by installing the Hughes MG-12 system and fitting a pair of Genie nuclear-tipped rockets. Approx. 1,050 Scorpions were delivered to the U.S.A.F.

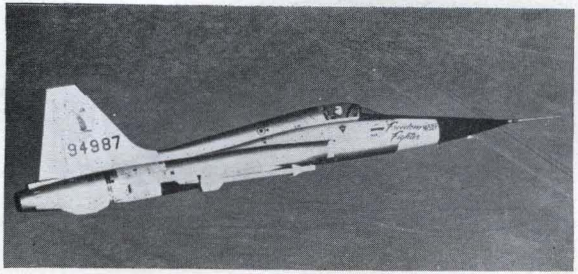
Nationality: American. **Type:** Two-seat All-weather Interceptor. **Power Plants:** Two 5,450 lb.s.t. (7,200 lb. with afterburning) Allison J35-A-35 turbojets. **Armament:** Two MB-1 Genie unguided nuclear missiles and 104 2·75-in. rockets. **Weight:** Loaded, 42,590 lb. **Performance:** Max. speed, 595 m.p.h. at 36,000 ft. (Mach 0·9); range, 994 mls., max., 1,690 mls.; service ceiling, 51,180 ft. **Dimensions:** Span, 59 ft. 8 in.; length, 53 ft. 10 in.; height, 17 ft. 7 in.; wing area, 562 sq. ft.

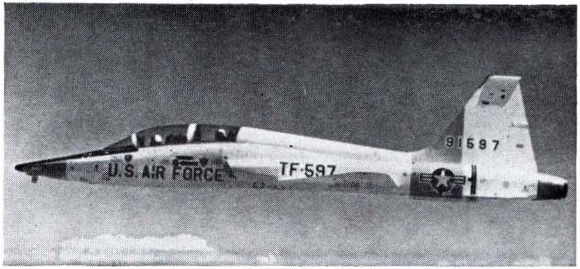


NORTHROP N-156F

Developed initially as a private venture, the N-156F received U.S. Department of Defence support for three prototypes, the first of which flew on July 30, 1959. All three were evaluated during 1960, but no production orders have been placed.

Nationality: American. **Type:** Single-seat Interceptor and Fighter-bomber. **Power Plants:** Two 2,500 lb.s.t. (3,850 lb. with afterburning) General Electric J85-GE-5 turbojets. **Armament:** (Typical) Two Nord AA.25 and two Sidewinder missiles, or two 1,000-lb. and four 500-lb. bombs. **Weight:** Loaded, 12,351 lb.; max., 16,112 lb. **Performance:** Max. speed, 990 m.p.h. at 40,000 ft. (Mach 1·5); initial climb, 28,000 ft./min. **Dimensions:** Span, 25 ft. 3 in.; length, 45 ft. 1 in.; height, 13 ft. 1 in.; wing area, 171·15 sq. ft.

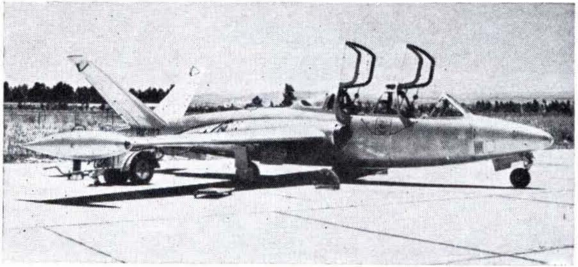




NORTHROP T-38A TALON

The first supersonic aircraft designed from the outset for the training rôle, the Talon entered service with the U.S.A.F. Air Training Command early in 1961, and 213 aircraft of this type are currently on order. The first prototype Talon flew on April 10, 1959, with 2,100 lb.s.t. YJ85-GE-1 turbojets.

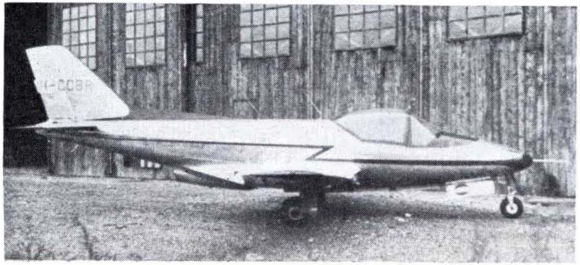
Nationality: American. **Type:** Two-seat Basic Trainer. **Power Plants:** Two 2,500 lb.s.t. (3,850 lb. with afterburning) General Electric J85-GE-5 turbojets. **Weight:** Max. loaded, 11,650 lb. **Performance:** Max. speed (at 9,000 lb.), 838 m.p.h. at 36,000 ft. (Mach 1·27); initial climb, 28,500 ft./min.; service ceiling, 56,800 ft.; endurance (navigational training mission), 2 hrs. 20 min.; range, 1,150 mls. **Dimensions:** Span, 25 ft. 3 in.; length, 44 ft. 2 in.; height, 12 ft. 10 in.; wing area, 170 sq. ft.



POTEZ-AIR FOUGA C.M.170 MAGISTER

Manufactured under licence in Germany, Finland and Israel, the Magister has been adopted by the French, Austrian, Finnish, Belgian, Katangan, Israeli and German air arms, and thirty navalised machines have been supplied to the Aeronvale as the C.M. 175 Zéphyr.

Nationality: French. **Type:** Two-seat Basic Trainer. **Power Plants:** Two 836 lb.s.t. Turboméca Marboré II turbojets. **Armament:** Two 7·5-mm. machine guns and two 110-lb. bombs. **Weights:** Empty, 4,268 lb.; max. loaded, 6,978 lb. **Performance:** Max. speed, 443 m.p.h. at 30,000 ft.; initial climb, 3,350 ft./min.; service ceiling, 40,000 ft.; range, 576 mls. at 30,000 ft. **Dimensions:** Span, 37 ft. 0⅞ in.; length, 33 ft. 9½ in.; height, 9 ft. 2¼ in.; wing area, 186·215 sq. ft.



PROCAER F.400 COBRA

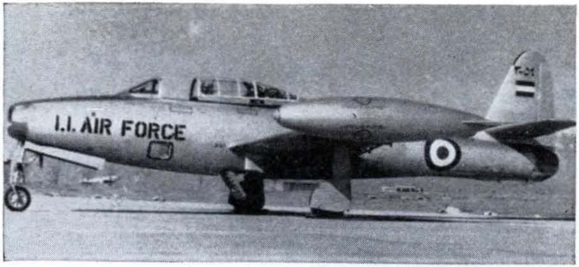
First flown in November 1960, the Cobra has been built by the Societa Procaer as a light training and touring aircraft. Fully aerobatic, the Cobra will, in its definitive version, have a 1,058 lb.s.t. Marboré VI turbojet permitting a 930-mile range, and a four-seat variant is currently under development.

Nationality: Italian. **Type:** Two-seat Trainer and Tourer. **Power Plant:** One 880 lb.s.t. Turboméca Marboré turbojet. **Weights:** Empty, 2,314 lb.; max. loaded, 3,858 lb. **Performance:** (Design) Max. speed, 345 m.p.h. at sea level; cruising, 292 m.p.h. at 13,120 ft.; initial climb, 3,150 ft./min.; service ceiling, 25,000 ft.; range (standard tankage), 622 mls., (with auxiliary tanks), 817 mls. **Dimensions:** Span, 28 ft. 6½ in.; length, 25 ft. 7 in.; height, 9 ft. 2¼ in.; wing area, 125·937 sq. ft.

REPUBLIC F-84G THUNDERJET

Still serving with the air forces of Iran, Portugal, Thailand, and Yugoslavia, the F-84G was the final production model of the Thunderjet, 4,457 examples of which were built. the last being delivered in July 1953. An Iranian F-84G is illustrated.

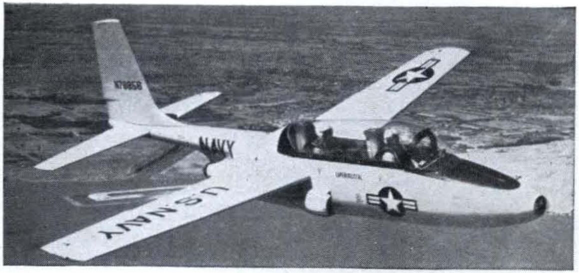
Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,600 lb.s.t. Allison J35-A-29 turbojet. **Armament:** Six 0·5-in. machine guns and thirty-two 5-in. rockets. **Weights:** Empty, 11,095 lb.; loaded, 18,645 lb.; max., 23,525 lb. **Performance:** Max. speed, 622 m.p.h. at sea level (Mach 0·82); cruising, 483 m.p.h.; range (at 21,700 lb.), 2,000 mls.; service ceiling, 40,500 ft.; climb to 35,000 ft. (clean), 7·9 min. **Dimensions:** Span, 36 ft. 5 in.; length, 38 ft. 1 in.; height, 12 ft. 7 in.; wing area, 260 sq. ft.



TEMCO TT-1 PINTO

The only jet trainer possessing a total thrust of less than 1,000 lb. to attain production, the TT-1 Pinto first flew on March 26, 1956, and fourteen aircraft of this type were delivered to the U.S. Navy from September 1957. The Pinto has been extensively evaluated but no additional orders have been placed.

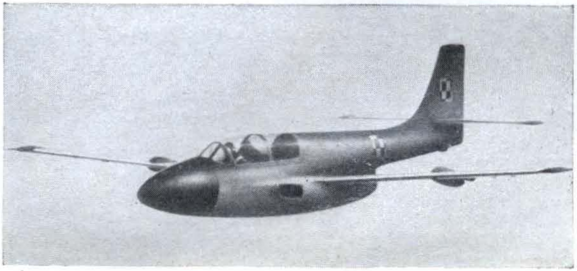
Nationality: American. **Type:** Two-seat Primary Trainer. **Power Plant:** One 920 lb.s.t. Continental J68-T-9 turbojet. **Weights:** Empty, 3,139 lb.; normal loaded, 4,400 lb. **Performance:** Max. speed (at 4,078 lb.), 316 m.p.h. at sea level; cruising, 276 m.p.h.; initial climb, 1,500 ft./min.; service ceiling, 32,000 ft.; endurance, 1·57 hrs. at sea level; max. diving speed, 520 m.p.h. **Dimensions:** Span, 29 ft. 10 in.; length, 30 ft. 7 in.; height, 10 ft. 10 in.; wing area, 150 sq. ft.

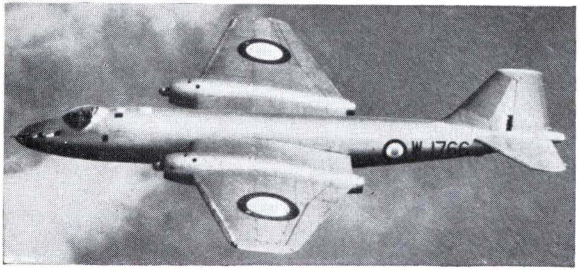


TS-11 ISKRA

Flown for the first time early in 1960, the Iskra (Spark) was designed by Dipl. Ing. Tadeusz Soltyk to meet a Polish Air Force requirement. Design development was initiated in 1956, but delays in the construction of a prototype resulted from Poland's inability to obtain a turbojet of suitable size and thrust from abroad. The prototype is now fitted with a 2,200 lb.s.t. turbojet of indigenous design, but no details of the results of flight testing have yet been revealed and no production orders have been announced. The TS-11 is intended as a successor to the TS-8 Bies illustrated on page 317.

Nationality: Polish. **Type:** Two-seat Basic Trainer. **Power Plant:** One 2,200 lb.s.t. turbojet. **Weights, Performance, Dimensions:** No details available for publication.

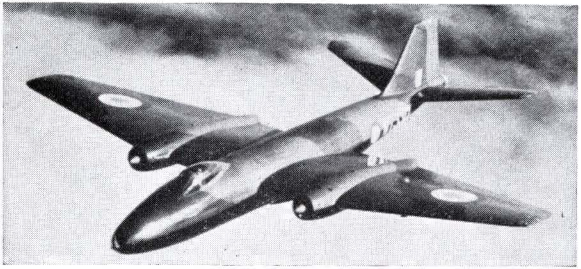




ENGLISH ELECTRIC CANBERRA B.6

The Canberra B.6 differed from the initial production B.2 primarily in having the 6,500 lb.s.t. Avon 101s supplanted by uprated Avon 109s. Some have been converted as interim night interdictors under the designation B.(I).6. The Canberra P.R.7 is a photo-reconnaissance version of the B.6.

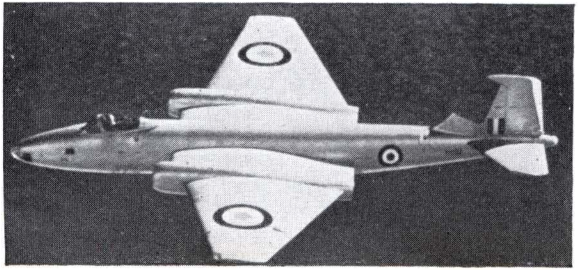
Nationality: British. **Type:** Three-seat Light Tactical Bomber. **Power Plants:** Two 7,500 lb.s.t. Rolls-Royce Avon 109 turbojets. **Armament:** (Internal) 6,000-lb. bomb load. **Weights:** Normal loaded, 51,448 lb.; max., 56,250 lb. **Performance:** Max. speed, 518 m.p.h. at sea level, 580 m.p.h. at 40,000 ft.; initial climb (at 55,590 lb), 3,400 ft./min.; ceiling, 48,000 ft.; ferry range, 3,630 mls. **Dimensions:** Span, 63 ft. 11½ in.; length, 65 ft. 6 in.; height, 15 ft. 7 in.; wing area, 960 sq. ft.



ENGLISH ELECTRIC CANBERRA B.(I).8

Differing from the B.6 primarily in having an offset fighter-type cockpit canopy, the Canberra B.(I).8 has been exported to several countries, including New Zealand and India, as the B.(I).12 and B.(I).58 respectively. Canberra B.(I).8s have also been supplied to the Peruvian and Venezuelan air arms.

Nationality: British. **Type:** Two-seat Light Bomber and Intruder. **Power Plants:** Two 7,500 lb.s.t. Rolls-Royce Avon 109 turbojets. **Armament:** Four 20-mm. Hispano cannon, and 5,000-lb. bomb load. **Weights:** Empty, 23,173 lb.; max., 56,250 lb. **Performance:** Max. speed, 518 m.p.h. at sea level, 580 m.p.h. at 40,000 ft.; initial climb (at 55,134 lb.), 3,400 ft./min.; max. range (interdictor), 800 mls. at 403 m.p.h. at 2,000 ft. **Dimensions:** Similar to those of Canberra B.6.



ENGLISH ELECTRIC CANBERRA P.R.9

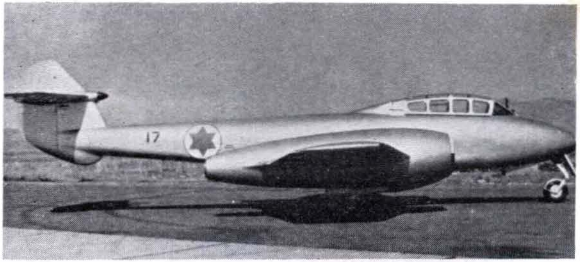
Evolved for operation at extreme altitudes from the B.(I).8, the Canberra P.R.9 features an extended wing span and inboard wing sections of increased chord. The navigator's station was extensively redesigned and provided with an ejector seat under a frangible hatch, and later, more powerful Avons were fitted. The prototype Canberra P.R.9 flew for the first time on July 8, 1955, and the first production machine flew on July 27, 1958, production terminating in 1960.

Nationality: British. **Type:** Two-seat High-altitude Photo-reconnaissance Aircraft. **Power Plants:** Two 10,050 lb.s.t. Rolls-Royce Avon 206 turbojets. **Weights and Performance:** No details available for publication. **Dimensions:** Span, 67 ft. 10 in.; length, 66 ft. 8 in.; height, 15 ft. 7 in.

GLOSTER METEOR T.7

A tandem two-seat variant of the single-seat Meteor F.4 fighter, the Meteor T.7 serves with the R.A.F. and the Belgian, Dutch, Brazilian and Israeli air forces. Meteor T.7s are flying with both F.4 and F.8-type tail assemblies, and that illustrated belongs to the Israeli Defence Force/Air Force.

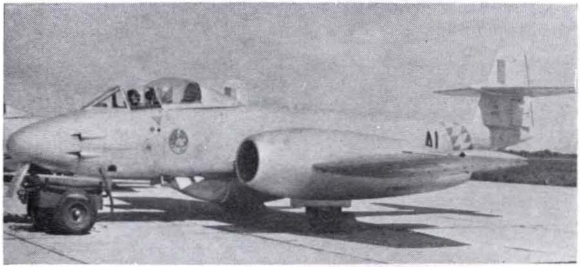
Nationality: British. **Type:** Two-seat Advanced Trainer. **Power Plants:** Two 3,500 lb.s.t. Rolls-Royce Derwent 5 turbojets. **Weights:** Empty, 10,290 lb.; loaded, 14,140 lb. **Performance:** Max. speed, 585 m.p.h. at sea level, 570 m.p.h. at 20,000 ft.; initial climb, 8,000 ft./min.; climb rate at 25,000 ft., 5,200 ft./min., at 40,000 ft., 2,050 ft./min.; range (standard tankage), 470 mls. at 30,000 ft. **Dimensions:** Span, 37 ft. 2 in.; length, 43 ft. 6 in.; height, 13 ft. 10 in.; wing area, 250 sq. ft.



GLOSTER METEOR F.8

Although now serving as first-line equipment with only the Brazilian Air Force, Meteor 8s are flying in secondary rôles in several countries, and the earlier Meteor F.4 still serves with the Argentine Air Force, the tail assembly being the principal difference between the two models. The accompanying photograph depicts a Meteor F.8 of the Brazilian Air Force.

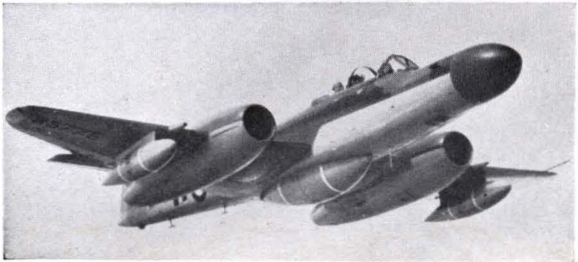
Nationality: British. **Type:** Single-seat Fighter. **Power Plants:** Two 3,600 lb.s.t. Rolls-Royce Derwent R.D.8 turbojets. **Armament:** Four 20-mm. cannon. **Weights:** Empty, 10,626 lb.; max. loaded, 17,350 lb. **Performance:** Max. speed, 592 m.p.h. at sea level; initial climb, 7,700 ft./min.; service ceiling, 44,000 ft.; range, 767 mls. **Dimensions:** Span, 37 ft. 2 in.; length, 43 ft. 6 in.; height, 13 ft. 10 in.; wing area, 350 sq. ft.

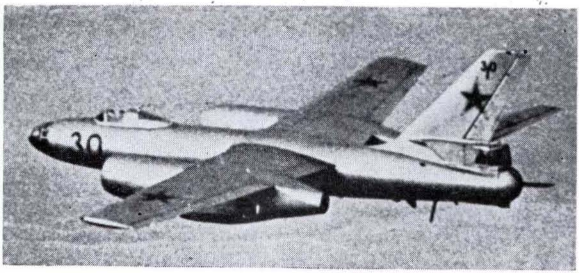


GLOSTER (ARMSTRONG WHITWORTH) METEOR N.F.14

Currently being phased out of service with the Far East Air Force, the Meteor N.F.14 was the last Armstrong Whitworth-built night fighter variant of the basic design and the last version of the Meteor in first-line R.A.F. service. The Meteor N.F.(T.) 14 serves with the R.A.F.'s No. 2 Air Navigation School.

Nationality: British. **Type:** Two-seat Night Fighter. **Power Plants:** Two 3,600 lb.s.t. Rolls-Royce Derwent R.D.8 turbojets. **Weights:** Empty, 14,600 lb.; loaded, 20,444 lb. **Armament:** Four 20-mm. cannon. **Performance:** Maximum speed, 576 m.p.h. at 9,842 ft.; initial climb, 5,800 ft./min.; service ceiling, 43,000 ft.; range (with maximum external fuel), 1,010 mls. at 30,000 ft. **Dimensions:** Span, 43 ft.; length, 51 ft. 4¼ in.; height, 13 ft. 11 in.; wing area, 374 sq. ft.

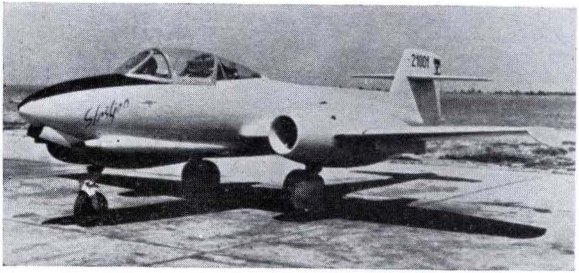




ILYUSHIN IL-28 (BEAGLE)

Despite its obsolescence, having entered service in 1950, the Il-28 is widely used by the Soviet Air Forces and Naval Air Arm. A training variant, the Il-28U (Mascot), is illustrated on page 85. During 1960, a number of Il-28s were converted for meteorological purposes, and several have been used by *Aeroflot* under the designation Il-20.

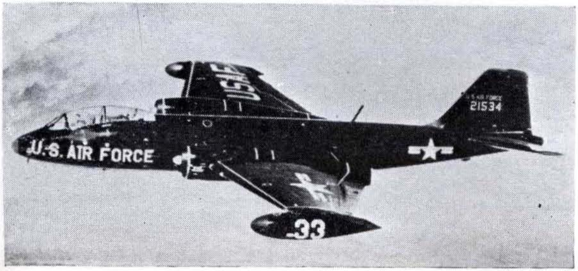
Nationality: Russian. **Type:** Four-seat Light Attack Bomber. **Power Plants:** Two 5,950 lb.s.t. Klimov VK-1 turbojets. **Armament:** Two forward-firing 23-mm. cannon, two rearward-firing 20-mm. cannon and up to 4,000 lb. bombs. **Weights:** Empty, 21,000 lb.; loaded, 37,500 lb.; max., 41,880 lb. **Performance:** Max. speed, 523 m.p.h. at 8,200 ft., 420 m.p.h. at 32,800 ft. **Dimensions:** Span, 72 ft. 2 in.; length, 65 ft. 6 in.; height, 22 ft.



J-451MM STRSLJEN

A lightweight close-support aircraft derived from the Type 451M Zolja illustrated on the opposite page, the J-451MM Strsljen (Hornet) has provision for carrying two HVAR or four SCAR rockets underwing. A single-seat trainer variant is designated T-451M Strsljen II, and a light photographic-reconnaissance variant is under development.

Nationality: Yugoslav. **Type:** Single-seat Close-support Aircraft. **Power Plants:** Two 880 lb.s.t. Turboméca Marboré II turbojets. **Armament:** Two 20-mm. Hispano-Suiza cannon and various external ordnance loads. **Weight:** Loaded, 5,370 lb. **Performance:** Max. speed, 497 m.p.h.; service ceiling, 39,600 ft.; range, 470 mls. **Dimensions:** Span, 25 ft. 10½ in.; length, 26 ft. 3 in.; height, 5 ft. 6 in.; wing area, 121·6 sq. ft.

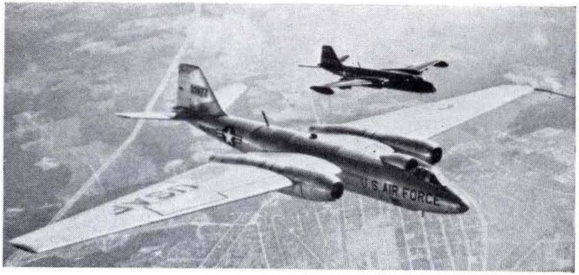


MARTIN B-57B

Derived from the English Electric Canberra, the B-57B is now operational with the Nationalist Chinese and Pakistani air arms. The B-57C is a dual-control training version, and the B-57E is similar but can be used as a bomber and target tug.

Nationality: American. **Type:** Two-seat Light Tactical Bomber. **Power Plants:** Two 7,220 lb.s.t. Wright J65-W-5 turbojets. **Armament:** Eight 0·5-in. or four 20-mm. guns and 5,000-lb. bomb load. **Weights:** Normal loaded, 49,000 lb.; max., 55,000 lb. **Performance:** Max. speed, 520 m.p.h. at sea level, 582 m.p.h. at 40,000 ft.; initial climb, 3,500 ft./min.; normal range, 2,300 mls., max., 2,650 mls.; ceiling, 48,000 ft. **Dimensions:** Span, 63 ft. 11½ in.; length, 65 ft. 6 in.; height, 15 ft. 7 in.; wing area, 960 sq. ft.

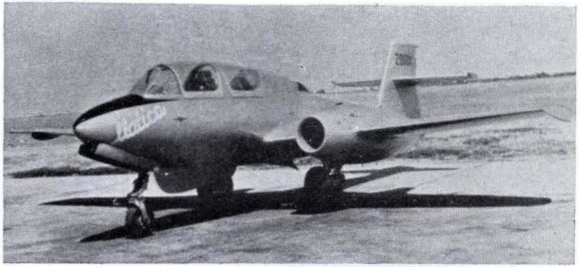
MARTIN RB-57D



Evolved from the B-57B for electronic and photographic reconnaissance at extreme altitudes, the RB-57D was built in several versions. The RB-57D(A) illustrated and (B) are photo-reconnaissance models while the RB-57D(C) and (D) are electronic reconnaissance machines with bulbous nose and tail radomes which increase overall length to 67 ft. 9¾ in. These are also fitted with ventral radomes, and the RB-57(C) has wingtip radomes which increase overall span to 107 ft. 6 in.

Nationality: American. **Type:** Single-seat High-altitude Reconnaissance Aircraft. **Power Plants:** Two 11,000 + lb.s.t. Pratt and Whitney J57C turbojets. **Performance:** Max. speed, 632 m.p.h. at 40,000 ft.; ceiling 60,000 ft. **Dimensions:** Span, 106 ft.; length, 65 ft. 6 in.; height, 14 ft. 10 in.

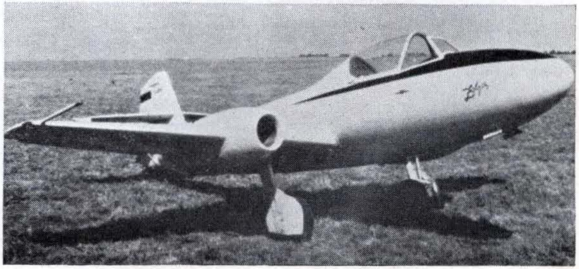
S-451MM MATICA



Intended as a potential successor to the Type 213 Vihor basic trainer, the S-451MM Matica (Queen Bee) shares many common components with the single-seat J-451MM, and on May 19, 1960, the prototype established a new international record in the F.A.I. sub-class C.1.d (aircraft of 3,858–6,614 lb. weight) with a speed of 466·24 m.p.h. No plans for the quantity production of the Matica have been revealed.

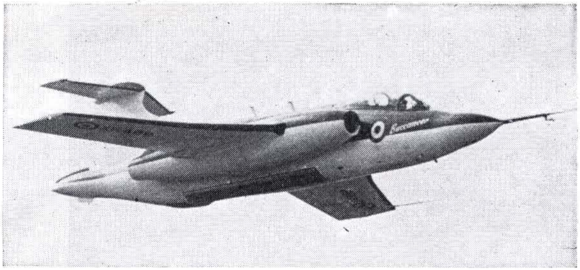
Nationality: Yugoslav. **Type:** Two-seat Basic Trainer. **Power Plants:** Two 880 lb.s.t. Turboméca Marboré II turbojets. **Weight:** Loaded, 5,172 lb. **Performance:** Maximum speed, 485 m.p.h.; minimum flying speed, 120 m.p.h.; range (at economical cruising), 340 mls.; service ceiling, 38,880 ft. **Dimensions:** Span, 26 ft. 0½ in.; length, 27 ft. 9 in.; height, 5 ft. 10½ in.

TYPE 451M ZOLJA



One of the first of the series of light twin-jet aircraft designed by Major Dragoljub Beslin, the first prototype Type 451M, flown in 1952, was Yugoslavia's first jet aircraft of indigenous design. Several aircraft of this type have been built for research purposes, and one of these established a new international speed record in F.A.I. sub-class C.1.c (aircraft of 2,204–3,858 lb. weight) of 310·279 m.p.h. on May 19, 1960.

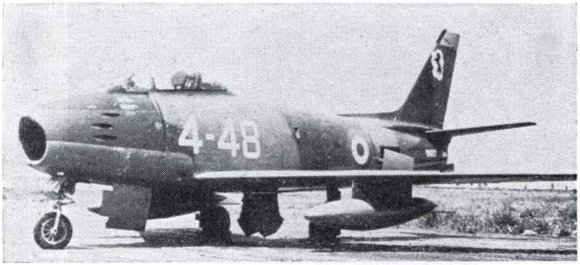
Nationality: Yugoslav. **Type:** Single-seat Research Aircraft. **Power Plants:** Two 330 lb.s.t. Turboméca Palas turbojets. **Weight:** Loaded, 2,665 lb. **Performance:** Max. speed, 315 m.p.h.; minimum speed, 95 m.p.h.; range, 243 mls.; service ceiling, 28,051 ft. **Dimensions:** Span, 22 ft. 1¾ in.; length, 22 ft. 3¾ in.; height 7 ft. 6½ in.; wing area, 86·11 sq. ft.



BLACKBURN B.103 BUCCANEER

Scheduled to enter service with the Royal Navy in 1962, the Buccaneer joined No. 700 " Z " Squadron in March 1961 for service trials. The first of a development batch of twenty Buccaneers made its initial flight on April 30, 1958, and an order for an additional fifty machines was placed on September 30, 1959. The Buccaneer carries tactical nuclear or conventional weapons internally on a rotary door.

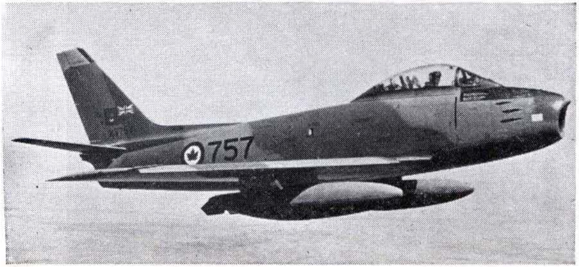
Nationality: British. **Type:** Two-seat Shipboard Low-level Strike Aircraft. **Power Plants:** Two 7,100 lb.s.t. de Havilland Gyron Junior 101 turbojets. **Weight:** Approx. loaded, 42,000 lb. **Performance:** Estimated max. speed, 720 m.p.h. at sea level (Mach 0·95). **Dimensions:** Span, 42 ft. 6 in.; length, 62 ft. 4 in.; height, 16 ft.



CANADAIR CL-13 SABRE MK. 4

With the completion of 350 CL-13 Sabre Mk. 2s (identical to the F-86E), Canadair introduced several minor modifications resulting in the Sabre Mk. 4, 438 examples of which were built. These have been supplied to several N.A.T.O. air forces, together with earlier Mk. 2s brought up to Mk. 4 standards.

Nationality: Canadian. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,200 lb.s.t. General Electric J47-GE-13 turbojet. **Armament:** Six 0·5-in. guns. **Weights:** Empty, 11,100 lb.; loaded (clean), 14,640 lb.; max., 17,750 lb. **Performance:** Max. speed, 599 m.p.h. at sea level, 616 m.p.h. at 15,000 ft., 576 m.p.h. at 35,000 ft.; initial climb, 7,150 ft./min.; combat radius (clean), 440 mls. **Dimensions:** Span, 37 ft. 1 in.; length, 37 ft. 6 in.; height, 14 ft. 7 in.; wing area, 287·9 sq. ft.



CANADAIR CL-13B SABRE MK. 6

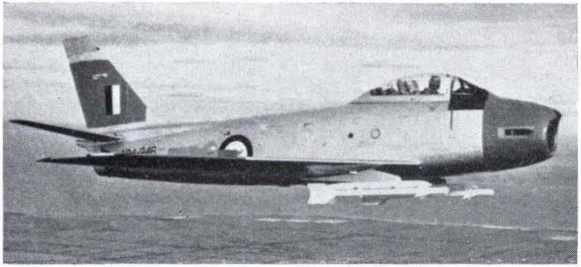
The final Canadian production version of the Sabre, the Mk. 6 differs from the Mk. 5 (370 built) in having the 6,355 lb.s.t. Orenda 10 replaced by an Orenda 14. The Sabre Mk. 6 currently equips eight European-based R.C.A.F. squadrons and has been supplied to Germany, Colombia and South Africa.

Nationality: Canadian. **Type:** Single-seat Interceptor Fighter. **Power Plant:** One 7,275 lb.s.t. Orenda 14 turbojet. **Armament:** Six 0·5-in. guns. **Weights:** Empty, 11,143 lb.; loaded, 16,426 lb.; max., 17,611 lb. **Performance:** (At 14,044 lb.) Max. speed, 710 m.p.h. at sea level, 680 m.p.h. at 10,000 ft., 620 m.p.h. at 36,000 ft.; initial climb, 11,800 ft./min.; radius, 363 mls.; max. range, 1,495 mls. **Dimensions:** Span, 37 ft. 1 in.; length, 37 ft. 6 in.; height, 14 ft. 7 in.; wing area, 304 sq. ft.

COMMONWEALTH CA-27 SABRE MK. 32

An extensively modified version of the F-86F Sabre, the CA-27 currently equips three R.A.A.F. fighter-bomber squadrons. The prototype CA-27 flew on August 3, 1953, and the first production Sabre Mk. 30 (with imported Avon) followed on July 13, 1954. The Mk. 31 has the earlier C.A.C.-built Avon 20 turbojet.

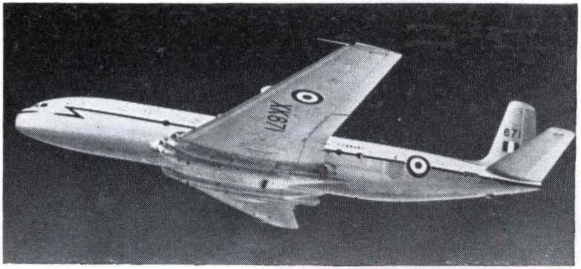
Nationality: Australian. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 7,500 lb.s.t. C.A.C.-built Avon 26 turbojet. **Armament:** Two 30-mm. cannon and two Sidewinders or 1,200 lb. bombs. **Weights:** Empty, 12,000 lb.; loaded, 15,990 lb.; max., 17,300 lb. **Performance:** Max. speed, 700 m.p.h. at sea level, 672 m.p.h. at 10,000 ft.; initial climb, 12,000 ft./min.; ceiling, 50,000 ft.; max. range, 1,150 mls. **Dimensions:** Span 37 ft. 1¼ in.; length, 37 ft. 6 in.; height, 14 ft. 4¾ in.; wing area, 304 sq. ft.



DE HAVILLAND COMET C.2

Eight Comet C.2s are operated by No. 216 Squadron of R.A.F. Transport Command on long-range mixed passenger and freight operations, and these are to be supplemented by five Comet 4Cs. The Comet T.2 is externally similar to the C.2 but, used for crew training, is not modified for freight carrying.

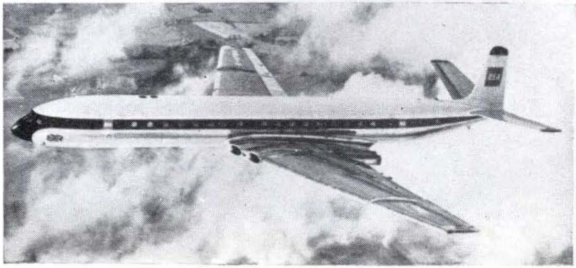
Nationality: British. **Type:** Long-range Military Passenger and Freight Transport. **Power Plants:** Four 7,300 lb.s.t. Rolls-Royce Avon 117/8 turbojets. **Weight:** Max. loaded, 127,600 lb. **Performance:** Max. speed, 508 m.p.h. at 40,000 ft. (Mach 0·77); cruising, 488 m.p.h. at 36,000–40,000 ft. (Mach 0·73); max. stage length (with full payload), 2,535 mls. **Accommodation:** Forty-four passengers. **Dimensions:** Span, 115 ft.; length, 96 ft.; height, 29 ft. 6 in.; wing area, 2,027 sq. ft.

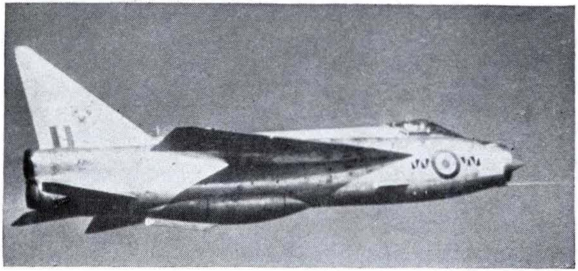


DE HAVILLAND COMET 4B

The Comet 4B, operated by B.E.A. and Olympic, differs from the basic Comet 4 in having a 6 ft. 6 in. increase in fuselage length to increase accommodation from 60–81 to 72–102 passengers, a reduction in wing span from 114 ft. 10 in. to 107 ft. 10 in., and the wing pinion tanks deleted. The Comet 4C combines the wings of the Comet 4 with the longer fuselage of the 4B.

Nationality: British. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 10,500 lb.s.t. Rolls-Royce Avon 525B turbojets. **Weights:** Basic, 77,950 lb.; max., 158,000 lb. **Performance:** Normal cruising, 530 m.p.h. at 20,000–38,000 ft.; max. range, 2,570 mls. **Accommodation:** 72–102 passengers. **Dimensions:** Span, 107 ft. 10 in.; length, 118 ft.; height, 29 ft. 6 in.; wing area, 2,059 sq. ft.

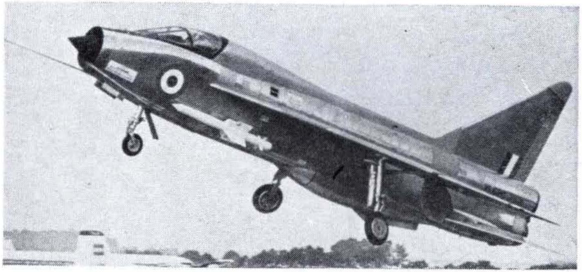




ENGLISH ELECTRIC LIGHTNING F.1

Now supplanting the Hunter in R.A.F. Fighter Command, the Lightning is unique among current single-seat Mach 2·0 interceptors in having two turbojets. Later production models are reportedly to have 13,220 lb.s.t. Avon 300 Series engines, and the Lightning F.3 will carry an improved guided weapon.

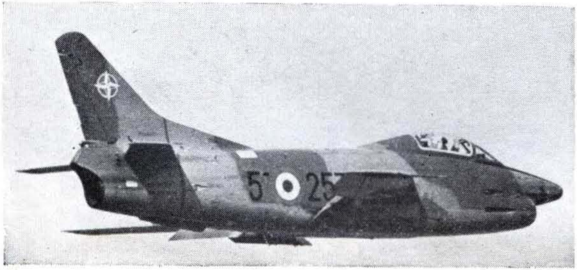
Nationality: British. **Type:** Single-seat Day and All-weather Interceptor. **Power Plants:** Two 11,250 lb.s.t. (14,430 lb. with afterburning) Rolls-Royce Avon 200 Series turbojets. **Armament:** Two or four 30-mm. cannon and two Firestreak missiles or forty-eight 2-in. rockets. **Performance:** Approx. max. speed, 1,386 m.p.h. at 40,000 ft. (Mach 2·1); max. climb rate, 30,000 + ft./min.; service ceiling, 60,000 ft. **Dimensions:** Span, 34 ft. 10 in.; length, 50 ft.; height, 19 ft. 5 in.



ENGLISH ELECTRIC LIGHTNING T.4

Flown for the first time on May 6, 1959, the Lightning T.4 has side-by-side ejector seats for the instructor and pupil, and the increased cross-sectional area resulting from the larger cockpit and canopy has been compensated for by a reduction in the cross section below and aft. Aft of the cockpit, the Lightning T.4 is identical to the F.1, and Ferranti Airpass radar and the twin-Firestreak pack are fitted so that operational sorties can be flown.

Nationality: British. **Type:** Two-seat Operational Trainer. **Power Plants:** Two 11,250 lb.s.t. (14,430 lb. with afterburning) Rolls-Royce Avon 200 Series turbojets. **Armament:** Two Firestreak missiles. **Performance:** Similar to Lightning F.1. **Dimensions:** Span, 34 ft. 10 in.; length, 50 ft.; height, 19 ft. 5 in.



FIAT G.91R.1

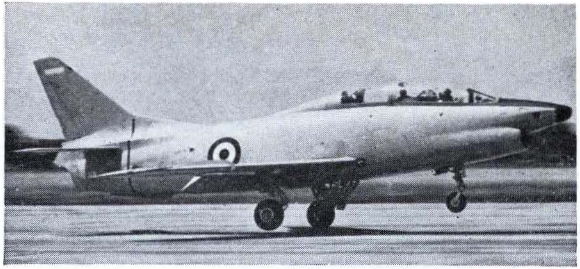
The G.91R.1 is essentially similar to the original G.91 lightweight strike fighter apart from having a photographic nose. It carries the same armament load. The G.91R.3 for West Germany differs principally in having two 30-mm. cannon, and a total of 282 has been ordered for the Luftwaffe.

Nationality: Italian. **Type:** Single-seat Reconnaissance and Strike Fighter. **Power Plant:** One 5,000 lb.s.t. Bristol Siddeley Orpheus 803 turbojet. **Armament:** Four 0·5-in. guns and two 500-lb. bombs. **Weights:** Empty, 6,550 lb.; loaded, 11,365 lb.; max., 12,500 lb. **Performance:** Max. speed, 668 m.p.h. at sea level (Mach 0·88), 637 m.p.h. at 20,000 ft. (Mach 0·91), initial climb, 6,000 ft./min. **Dimensions:** Span, 28 ft. 2½ in.; length, 34 ft. 2½ in.; height, 13 ft. 1¼ in.; wing area, 176·74 sq. ft.

FIAT G.91T.3

Essentially a tandem two-seat training version of the single-seat G.91, the G.91T was flown for the first time on May 31, 1960. Twenty machines have been ordered by West Germany and a further twenty-five are to be delivered to the Italian Air Force. The G.91T can carry various external ordnance loads.

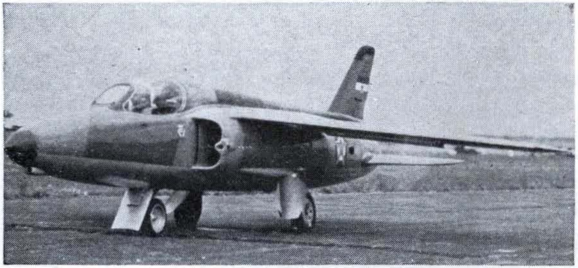
Nationality: Italian. **Type:** Two-seat Basic and Operational Trainer. **Power Plant:** One 5,000 lb.s.t. Bristol Siddeley Orpheus 803102 turbojet. **Armament:** Two 12·7-mm. guns. **Weights:** Empty, 7,275 lb.; loaded, 11,794 lb. **Performance:** Max. speed, 633 m.p.h. at sea level; time to 13,120 ft., 4 min. 30 sec., to 26,250 ft., 8 min.; service ceiling, 39,370 ft.; range (with 444 Imp. gal.), 1,367 mls. **Dimensions:** Span, 28 ft. 2½ in.; length, 38 ft. 3¾ in.; height, 13 ft. 11¼ in.



FOLLAND FO.141 GNAT

First flown on July 18, 1955, the Gnat lightweight fighter is being manufactured under licence in India, that country having received twenty complete aircraft and twenty sets of components from the U.K. Two were supplied to Yugoslavia (one of these being illustrated) and twelve were delivered to Finland.

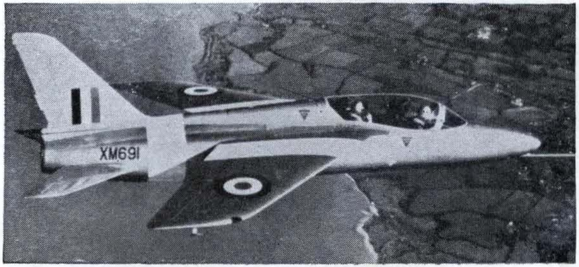
Nationality: British. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 4,850 lb.s.t. Bristol Siddeley Orpheus 701 turbojet. **Armament:** Two 30-mm. guns and 2,000-lb. external ordnance load. **Weights:** Basic, 4,850 lb.; loaded (clean), 6,400 lb.; max., 8,600 lb. **Performance:** Max. speed, 695 m.p.h. at 20,000 ft., 647 m.p.h. at 36,000 ft.; max. climb, 20,000 ft./min.; combat radius (clean), 250 mls. **Dimensions:** Span, 22 ft. 2 in.; length, 29 ft. 9 in.; height, 8 ft. 10 in.; wing area, 136·6 sq. ft.

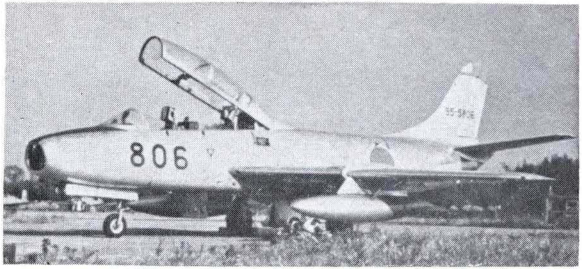


FOLLAND GNAT T.1

Shortly to enter service with R.A.F. Training Command, the Gnat Trainer was first flown on August 31, 1959, and a pre-production batch of fourteen aircraft and an initial production batch of thirty machines have been ordered. Various armament combinations can be mounted externally.

Nationality: British. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 4,230 lb.s.t. Bristol Siddeley Orpheus 100 turbojet. **Weights:** Basic, 5,470 lb.; max., 8,970 lb. **Performance:** Max. speed, 627 m.p.h. at 35,000 ft.; max. attainable Mach number in level flight, 0·97; initial climb, 8,000 ft./min.; service ceiling, 48,000 ft.; endurance (with maximum external fuel), 2·25 hrs. **Dimensions:** Span, 24 ft.; length, 30 ft. 9 in.; height, 9 ft. 7½ in.; wing area, 175 sq. ft.

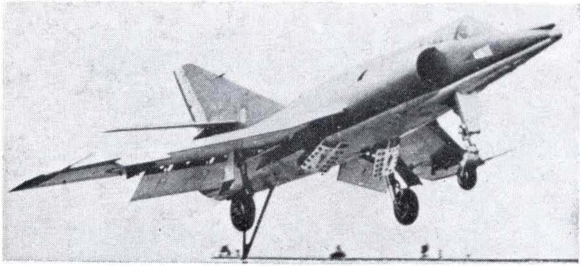




FUJI T1F2

The first indigenous Japanese jet aircraft of post-war design, the T1F2 has entered service with the J.A.S.D.F. as the T1A, and four pre-production and forty production examples have been ordered. The T1F1 (T1B) is essentially similar apart from the installation of a 2,645 lb.s.t. Nippon J3-1 turbojet.

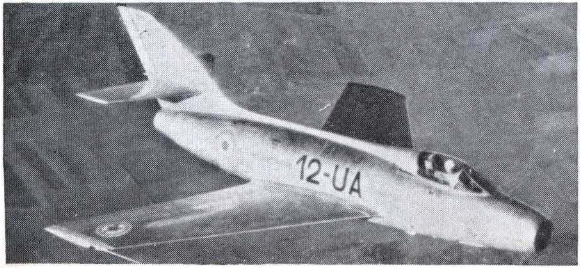
Nationality: Japanese. **Type:** Two-seat Basic Trainer. **Power Plant:** One 4,000 lb.s.t. Bristol Siddeley Orpheus 805 turbojet. **Weights:** Empty, 5,335 lb.; normal loaded, 8,800 lb.; max., 10,652 lb. **Performance:** Max. speed, 485 m.p.h. at 20,000 ft.; cruising, 286 m.p.h.; initial climb, 3,399 ft./min.; time to 30,020 ft., 13 min.; ceiling, 52,000 ft.; range (two 100 Imp. gal. drop tanks), 870 mls. **Dimensions:** Span, 34 ft. 5 in.; length, 39 ft. 9 in.; height, 13 ft. 4 in.; wing area, 239·2 sq. ft.



G.A.M. DASSAULT ETENDARD IVM

One hundred Etendard IVM strike fighters, fifteen of which are to have photographic noses (IVP), have been ordered for the Aéronavale, deliveries being scheduled to commence in November 1961. The third pre-production machine has an 11,200 lb.s.t. Rolls-Royce Avon 51 and has been adapted for flap blowing.

Nationality: French. **Type:** Single-seat Shipboard Strike Fighter. **Power Plant:** One 9,700 lb.s.t. S.N.E.C.M.A. Atar 8 turbojet. **Armament:** One 30-mm. cannon and four Sidewinders, or 3,000 lb. bombs. **Weights:** Normal loaded, 19,400 lb.; max., 22,500 lb. **Performance:** Max. speed, 713 m.p.h. at 36,000 ft. (Mach 1·08), 686 m.p.h. at sea level (Mach 0·9); tactical radius, 460 mls. **Dimensions:** Span, 31 ft. 6 in.; length, 47 ft. 3 in.; height, 13 ft. 7⅜ in.; wing area, 306 sq. ft.



G.A.M. DASSAULT MYSTÈRE IVA

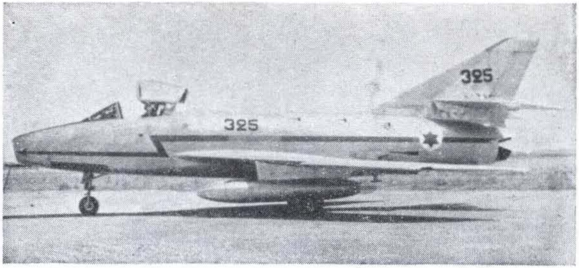
First flown on September 28, 1952, the Mystère IVA is used by the 2nd, 5th, and 8th Escadres of the Armée de l'Air, and by the air arms of India and Israel. Production was completed late in 1958 with the 421st Mystère IVA, the first fifty having the 6,280 lb.s.t. Hispano-Suiza Tay 250A turbojet.

Nationality: French. **Type:** Single-seat Interceptor. **Power Plant:** One 7,710 lb.s.t. Hispano-Suiza Verdon 350. **Armament:** Two 30-mm. cannon. **Weights:** Empty, 12,496 lb.; loaded, 16,535 lb. **Performance:** Max. speed, 696 m.p.h. at sea level (Mach 0·913), 615 m.p.h. at 39,370 ft. (Mach 0·94); initial climb, 8,860 ft./min.; endurance (standard internal tankage), 1 hr. 10 min. **Dimensions:** Span, 36 ft. 5¾ in.; length, 42 ft. 1¾ in.; height, 15 ft. 1 in.; wing area, 344·5 sq. ft.

G.A.M. DASSAULT SUPER-MYSTÈRE B.2

The first aircraft capable of attaining supersonic speeds in level flight to attain production status in Europe, the Super-Mystère serves with the Armée de l'Air's 10th and 12th Escadres, and Israel. One hundred and eighty Super-Mystères were built.

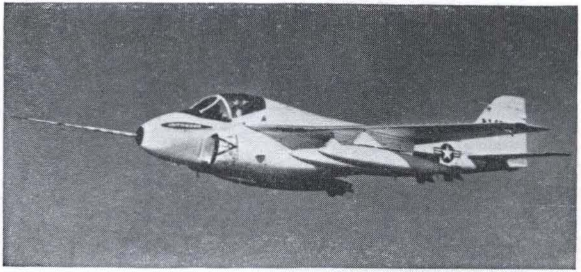
Nationality: French. **Type:** Single-seat Interceptor and Fighter-bomber. **Power Plant:** One 7,495 lb.s.t. (9,920 lb. with afterburning) S.N.E.C.M.A. Atar 101G turbojet. **Armament:** Two 30-mm. cannon and fifty-five 68-mm. rockets. **Weights:** Empty, 15,400 lb.; loaded, 19,840 lb.; max. 22,046 lb. **Performance:** Max. speed, 743 m.p.h. at 36,000 ft. (Mach 1·125); cruising, 620 m.p.h.; initial climb, 17,500 ft./min.; ceiling, 55,750 ft. **Dimensions:** Span, 34 ft. 5¾ in.; length, 46 ft. 1⅛ in.; height, 14 ft. 10¾ in.; wing area, 377 sq. ft.



GRUMMAN A2F-1 INTRUDER

Currently being evaluated by the U.S. Navy, the A2F-1 Intruder flew for the first time in April 1960. Intended for "under-the-radar" attacks, the A2F-1 is fitted with hinged tailpipes which are tilted 30° by hydraulic actuators to deflect the jet exhaust downward. All weapons are carried externally, and it is claimed that the A2F-1 can carry a more varied load of stores than any other naval attack aircraft.

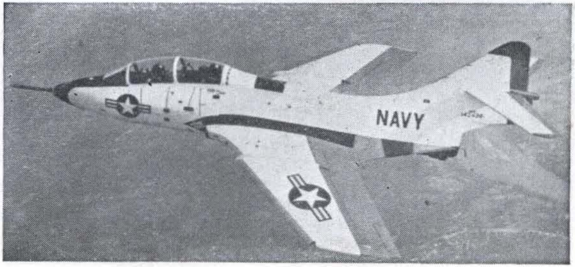
Nationality: American. **Type:** Two-seat Low-level Shipboard Strike Aircraft. **Power Plants:** Two 8,500 lb.s.t. Pratt and Whitney J52-P-6 turbojets. **Weights:** Empty, 24,000 lb.; max., 54,000 lb. **Performance:** Approx. max. speed, 685 m.p.h. at sea level (Mach 0·9). **Dimensions:** Span, 53 ft.; length, 53 ft. 5 in.; height, 15 ft. 1¾ in.

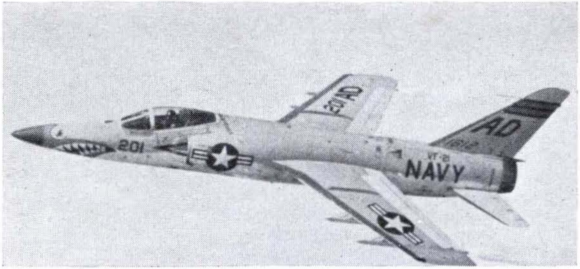


GRUMMAN F9F-8T COUGAR

Developed from the single-seat F9F-8, the last squadron of which, VMCJ-3, converted to Crusaders in 1960, the F9F-8T first flew on April 4, 1956, and the 399th and last fighter-trainer of this type was delivered to the U.S. Navy on February 2, 1960. In addition to training, the F9F-8T can be used as a fighter.

Nationality: American. **Type:** Two-seat Fighter-trainer. **Power Plant:** One 7,200 lb.s.t. (8,500 lb. with water injection) Pratt and Whitney J48-P-8A turbojet. **Armament:** Two 20-mm. cannon. **Weight:** Normal loaded, 20,600 lb. **Performance:** Max. speed, 705 m.p.h. at sea level, 550 m.p.h. at 36,000 ft.; climb to 40,000 ft., 8·5 min.; tactical radius (clean), 280 mls.; range (max. external fuel), 1,000 mls. **Dimensions:** Span, 34 ft. 6 in.; length, 48 ft. 6½ in.; height, 12 ft. 2⅞ in.

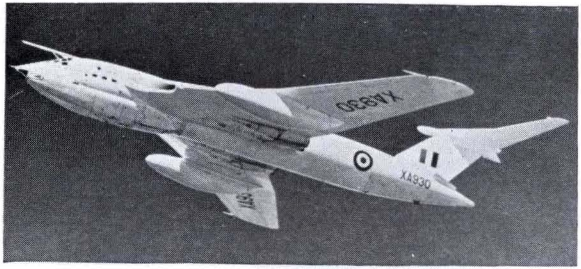




GRUMMAN F11F-1 TIGER

Soon to be supplanted by later types, such as the McDonnell F4H-1, the F11F-1 Tiger was the first aircraft designed to the transonic area rule, and entered service with the U.S. Navy early in 1958, production being completed on January 23, 1959. The F11F-1F was an experimental model with a J79-GE-3A.

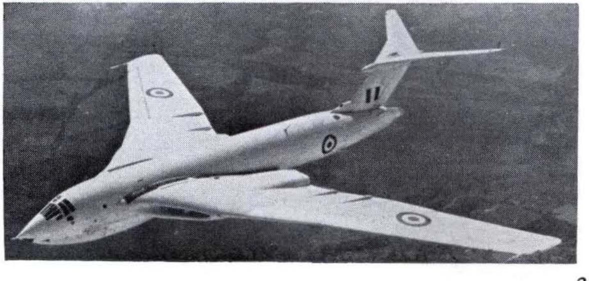
Nationality: American. **Type:** Single-seat Shipboard Interceptor. **Power Plant:** One 7,800 lb.s.t. (10,500 lb. with afterburning) Wright J65-W-18 turbojet. **Armament:** Four 20-mm. cannon and four Sidewinders. **Weights:** Empty, 13,307 lb.; normal loaded, 21,035 lb.; max., 24,078 lb. **Performance:** Max. speed, 740 m.p.h. at 35,000 ft. (Mach 1·12); tactical radius, 300 mls.; service ceiling, 50,500 ft. **Dimensions:** Span, 31 ft. 7½ in.; length, 44 ft. 11 in.; height, 13 ft. 3 in.; wing area, 249·72 sq. ft.



HANDLEY PAGE VICTOR B.1

Employed by Nos. 10, 15, 55 and 57 Squadrons of R.A.F. Bomber Command, the Victor B.1 entered service during 1958, the first production example having flown on February 1, 1956. A Spectre D.Spe.4 constant-thrust rocket can be fitted in a jettisonable pack to enable the Victor B.1 to operate from medium-length runways at overload weights.

Nationality: British. **Type:** Long-range Medium Bomber. **Power Plants:** Four 11,000 lb.s.t. Bristol Siddeley Sapphire 202 turbojets. **Weight:** Loaded, 150,000–180,000 lb. **Performance:** Approx. max. speed, 630 m.p.h. at 40,000 ft. (Mach 0·95); approx. range (standard internal tankage), 3,500 mls.; service ceiling, 50,000 + ft. **Dimensions:** Span, 110 ft.; length, 114 ft. 11 in.; height, 28 ft. 1½ in.; wing area, 2,406 sq. ft.



HANDLEY PAGE VICTOR B.2

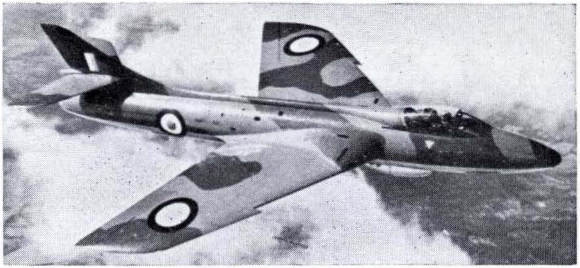
Flown for the first time on February 20, 1959, the Victor B.2 is currently entering service with R.A.F. Bomber Command but the original production order for this aircraft was curtailed in August 1960. By comparison with the B.1, the B.2 has increased span and larger air intakes for Conway turbojets.

Nationality: British. **Type:** Long-range Medium Bomber. **Power Plants:** Four 17,250 lb.s.t. Rolls-Royce Conway R.Co.11 turbojets. **Weight:** Loaded, 160,000–180,000 lb. **Performance:** Approx. max. speed, 630 m.p.h. at 40,000 ft. (Mach 0·95); approx. operational range (standard internal tankage), 3,500–4,000 mls.; service ceiling, 55,000 + ft. **Dimensions:** Span, 120 ft.; length, 114 ft. 11 in.; height, 30 ft.; wing area, 2,597 sq. ft.

HAWKER HUNTER F.6

In process of being phased out of R.A.F. service in favour of the Lightning, the Hunter F.6 serves with the Belgian, Dutch, Iraqi, Jordanian and Lebanese air forces. The earlier F.4 (8050 lb.s.t. Avon 113 or 115) serves with the Swedish (F.50), Danish (F.51), and Peruvian (F.52) air forces.

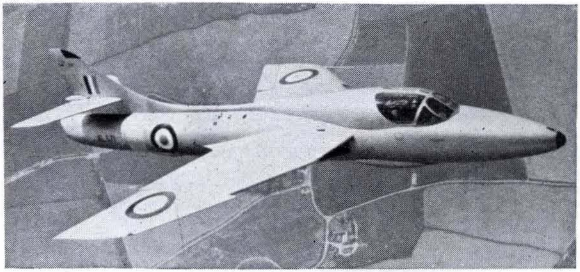
Nationality: British. **Type:** Single-seat Interceptor Fighter. **Power Plant:** One 10,050 lb.s.t. Rolls-Royce Avon 203 turbojet. **Armament:** Four 30-mm. cannon. **Weights:** Empty, 13,270 lb.; loaded, 17,600 lb.; max., 23,700 lb. **Performance:** Max. speed, 715 m.p.h. at sea level, 654 m.p.h. at 19,500 ft. (Mach 0·935), 617 m.p.h. at 39,000 ft.; absolute ceiling, 51,000 ft.; range (two 100 Imp. gal. drop tanks), 1,036 mls. **Dimensions:** Span, 33 ft. 8 in.; length, 45 ft. 10½ in.; height, 13 ft. 1¾ in.; wing area, 349 sq. ft.



HAWKER HUNTER T.7

A two-seater derived from the single-seat F.4, the Hunter T.7 serves with the R.A.F. and R.Neth.A.F., and the T.53 and T.62 are respectively versions for the Danish and Peruvian air arms. The Hunter T.8 for the Royal Navy has airfield arrester gear, and the T.66 for India has the 10,050 lb.s.t. Avon 203.

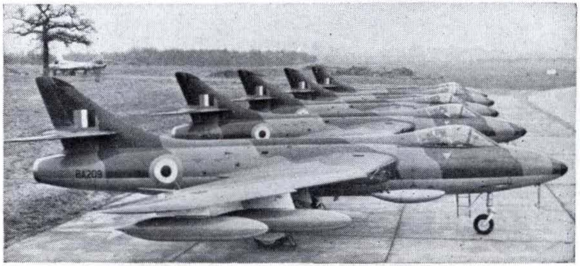
Nationality: British. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 7,700 lb.s.t. Rolls-Royce Avon 122 turbojet. **Armament:** One 30-mm. cannon. **Weights:** Empty, 12,950 lb.; normal loaded, 16,820 lb.; max., 22,000 lb. **Performance:** Max. speed, 694 m.p.h. at sea level; initial climb, 10,500 ft./min.; time to 40,000 ft., 9·5 min.; range (two 100 Imp. gal. drop tanks), 920 mls. **Dimensions:** Span, 33 ft. 8 in.; length, 48 ft. 10½ in.; height, 13 ft. 2 in.; wing area, 349 sq. ft.

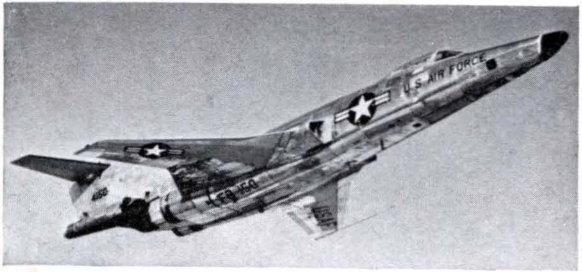


HAWKER HUNTER F.G.A.9

Derived from the F.6, the Hunter F.G.A.9 has boosted air conditioning, cutaway flaps and tail chute. The Indian Hunter F.56 (illustrated) has been built to F.G.A.9 standards as were also the last eighty-eight Swiss F.58s. The Hunter F.R.10 is a photo-reconnaissance version. The F.G.A.9 flew on July 3, 1959.

Nationality: British. **Type:** Single-seat Fighter Ground-attack Aircraft. **Power Plant:** One 10,050 lb.s.t. Rolls-Royce Avon 207 turbojet. **Armament:** Four 30-mm. cannon and 7,400-lb. external load. **Weight:** Max., 24,000 lb. **Performance:** Max. speed, 715 m.p.h. at sea level (Mach 0·938), 627 m.p.h. at 36,000 ft. (Mach 0·95); time to 46,000 ft., 6·75 min.; absolute ceiling, 53,400 ft.; range (max. eternal fuel), 1,854 mls. **Dimensions:** Similar to those of Hunter F.6.

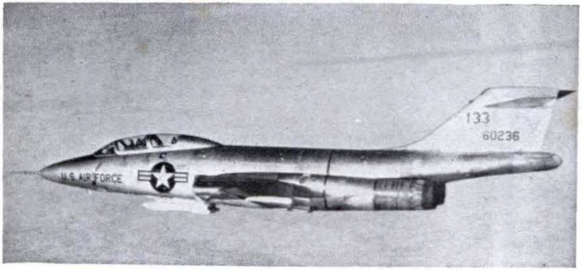




MCDONNELL RF-101A VOODOO

A photo-reconnaissance version of the F-101A designed as a long-range escort fighter for the U.S.A.F. Strategic Air Command before this concept was abandoned, the RF-101A has comprehensive and fully automatic camera equipment. Subsequent to the RF-101A-20 production batch wing fuel tanks were installed. RF-101C has increased max. loaded weight of 48,722 lb.

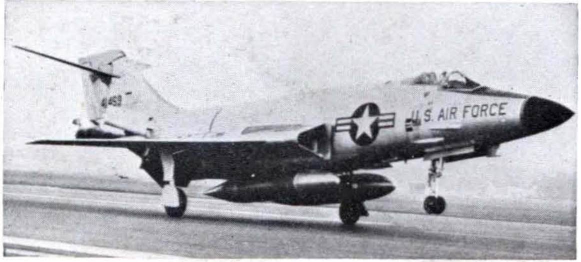
Nationality: American. **Type:** Single-seat Long-range Photo-reconnaissance Aircraft. **Power Plants:** Two 10,100 lb.s.t. (14,880 lb. with afterburning) Pratt and Whitney J57-P-13 turbojets. **Weights:** Normal loaded, 41,116 lb.; max., 47,399 lb. **Performance:** Max. speed, 1,120 m.p.h. at 40,000 ft. (Mach 1·7); range (max. external fuel), 2,800 mls. **Dimensions:** Span, 39 ft. 8 in.; length, 69 ft. 3 in.; height, 18 ft.; wing area, 368 sq. ft.



MCDONNELL F-101B VOODOO

A two-seat interceptor version of the F-101A, the F-101B serves with nine U.S.A.F. Air Defence Command squadrons, and some 500 had been built when production terminated in 1960. Three Falcon missiles can be carried on rotary weapons bay. Flown on March 27, 1957, the F-101B entered service in 1959.

Nationality: American. **Type:** Two-seat Interceptor. **Power Plants:** Two 11,990 lb.s.t. (14,990 lb. with afterburning) Pratt and Whitney J57-P-53 or -55 turbojets. **Armament:** Two Genie and three Falcon missiles. **Weights:** Normal loaded, 39,900 lb.; max., 46,473 lb. **Performance:** Max. speed, 1,220 m.p.h. at 40,000 ft. (Mach 1·85); initial climb, 14,000 ft./min.; max. range, 2,980 mls. **Dimensions:** Span, 39 ft. 8 in.; length, 67 ft. 4¾ in.; height, 18 ft.; wing area, 368 sq. ft.



MCDONNELL F-101C VOODOO

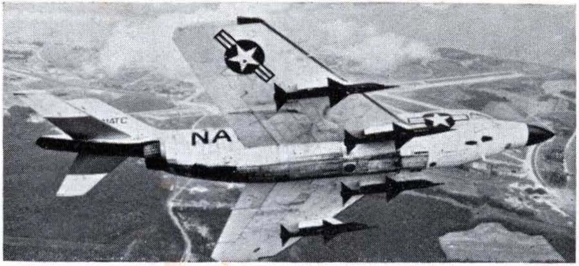
A structurally strengthened version of the original F-101A intended for the low-altitude close-support rôle, the F-101C has a pylon and crutch for nuclear or conventional weapons beneath the fuselage. A total of 327 single-seat Voodoos was built, and the F-101C serves with the U.S.A.F. Tactical A.C.

Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plants:** Two 10,100 lb.s.t. (14,880 lb. with afterburning) Pratt and Whitney J57-P-13 turbojets. **Armament:** Four 20-mm. cannon. **Weights:** Normal loaded, 39,680 lb.; max., 46,960 lb. **Performance:** Max. speed, 1,120 m.p.h. at 40,000 ft. (Mach 1·7); cruising, 595 m.p.h. at 36,000 ft.; initial climb, 14,000 ft./min.; service ceiling, 52,000 ft. **Dimensions:** Span, 39 ft. 8 in.; length, 67 ft. 4¾ in.; height, 18 ft.; wing area, 368 sq. ft.

MCDONNELL F3H-2M DEMON

A total of 519 Demon fighters had been completed when the last machine was delivered on November 17, 1959, 463 of these being F3H-2s, -2Ms, -2Ns and -2Ps. The F3H-2N is the all-weather model, the F3H-2M is the day fighter missile carrier, and the F3H-2P is the photo-reconnaissance variant.

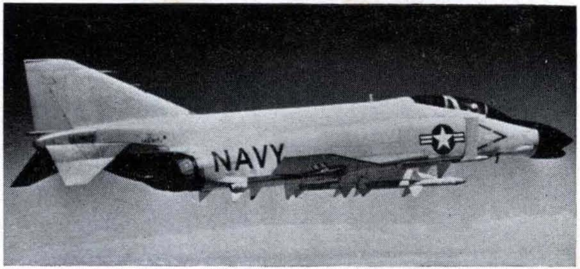
Nationality: American. **Type:** Single-seat Day Shipboard Interceptor. **Power Plant:** One 9,500 lb.s.t. (14,250 lb. with a/b) Allison J71-A-2 turbojet. **Armament:** Four 20-mm. cannon and four Sparrow IIIs. **Weights:** Empty, 22,133 lb.; loaded, 33,900 lb. **Performance:** Max. speed, 727 m.p.h. at sea level (Mach 0·95); initial climb, 12,795 ft./min.; service ceiling, 42,650 ft.; max. range, 1,367 mls. **Dimensions:** Span, 35 ft. 4 in.; length, 58 ft. 11 in.; height, 14 ft. 7 in.; wing area, 519 sq. ft.



MCDONNELL F4H-1 PHANTOM II

Now in process of entering service with the U.S. Navy, 192 having been ordered at the time of closing for press, the F4H-1 is one of the world's fastest combat aircraft. Pre-production machines had J79-GE-2A turbojets of 10,350 lb.s.t. (16,150 lb. with a/b), one of these holding 100- and 500-km. records.

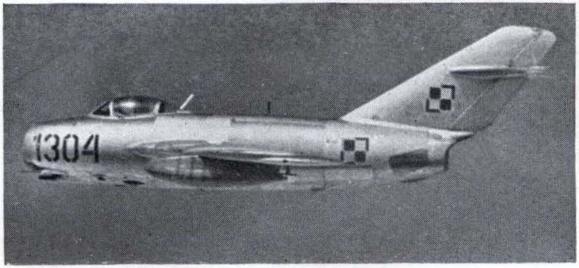
Nationality: American. **Type:** Two-seat Shipboard Interceptor and Strike Fighter. **Power Plants:** Two 10,500 lb.s.t. (16,500 lb. with afterburning) General Electric J79-GE-8 turbojets. **Armament:** Four Sparrow III and four Sidewinder IA missiles. **Weight:** Loaded, 40,000 + lb. **Performance:** Approx. max. speed, 1,584 m.p.h. at 48,000 ft. (Mach 2·4); service ceiling, 70,000 ft.; zoom climb altitude, 98,600 ft. **Dimensions:** Span, 38 ft. $4\frac{7}{8}$ in.; length, 58 ft. $3\frac{1}{8}$ in.; height, 16 ft. 3 in.

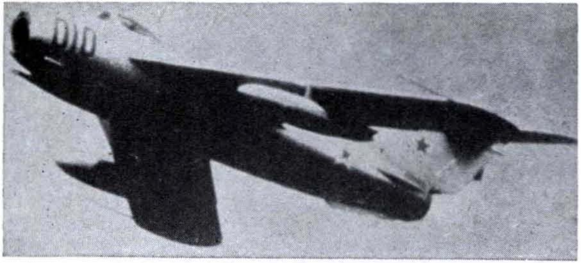


MIG-15 (FAGOT)

Serving with many communist air arms, the MiG-15 has been manufactured under licence in Czechoslovakia as the S-102 (RD-45) and S-103 (VK-1), and in Poland as the LIM-1 (RD-45), LIM-2 (VK-1) and LIM-4, the last being the close-support model. The MiG-15UTI two-seater is illustrated on page 86.

Nationality: Russian. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,950 lb.s.t. Klimov VK-1 turbojet. **Armament:** One 37-mm. and two 23-mm. cannon. **Weights:** Empty, 8,320 lb.; loaded, 14,227 lb. **Performance:** Max. speed, 668 m.p.h. at sea level, 656 m.p.h. at 10,000 ft.; initial climb, 10,400 ft./min.; range (standard tankage), 560 mls. at 466 m.p.h.; absolute ceiling, 51,000 ft. **Dimensions:** Span, 33 ft. 1 in.; length, 36 ft. $3\frac{1}{4}$ in.; height, 11 ft. $1\frac{3}{4}$ in.; wing area, 255·1 sq. ft.

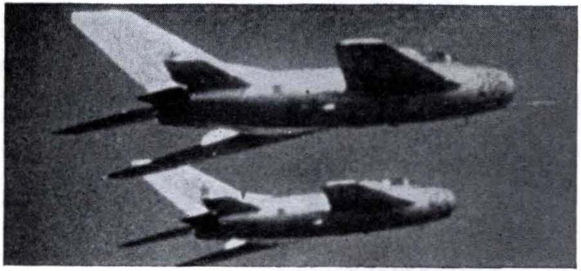




MIG-17 (FRESCO)

Employed by Afghanistan, Iraq, Indonesia, Cuba, and the U.A.R. as well as most communist air arms, the MiG-17 has been produced in several versions, these being detailed on page 83. It has been built under licence in Poland as the LIM-5, and twenty per month are currently being built in China.

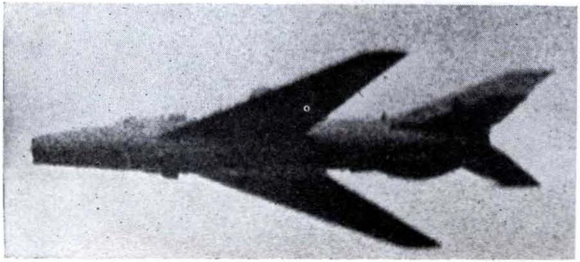
Nationality: Russian. **Type:** Single-seat Interceptor Fighter. **Power Plant:** One 5,950 lb.s.t. (6,990 lb. with afterburning) Klimov VK-1A turbojet. **Armament:** Three 23-mm. cannon and thirty-two 55-mm. rockets in external pods. **Weights:** Normal loaded, 13,000 lb.; max., 14,500 lb. **Performance:** Max. speed, 656 m.p.h. at 35,000 ft. (Mach 0·98), 630 m.p.h. at 50,000 ft.; combat radius (standard tankage), 300 mls. **Dimensions:** Span, 36 ft.; length, 38 ft.; height, 11 ft.



MIG-19 (FARMER)

The first Soviet production interceptor capable of exceeding Mach unity in level flight, the MiG-19 entered service in 1955. The initial service model had AM-5 engines with afterburning thrusts of 6,700 lb.s.t. and a lead pursuit optical gun sight. Late models have RP interception radar and AM-9b engines. A tandem two-seat trainer version exists.

Nationality: Russian. **Type:** Single-seat Interceptor. **Power Plants:** Two 5,500 lb.s.t. (7,150 lb. with afterburning) Mikulin AM-9b turbojets. **Armament:** Two or four 23-mm. cannon and two 220-mm. or 325-mm. missiles. **Weights:** Loaded, 17,500 lb.; max., 21,000 lb. **Performance:** Max. speed, 740 m.p.h. at 50,000 ft. (Mach 1·125), 860 m.p.h. at 36,000 ft. (Mach 1·3). **Dimensions:** Span, 36 ft. 6 in.; length, 44 ft. 3 in.; height, 13 ft. 6 in.



MIG-21 (FACEPLATE)

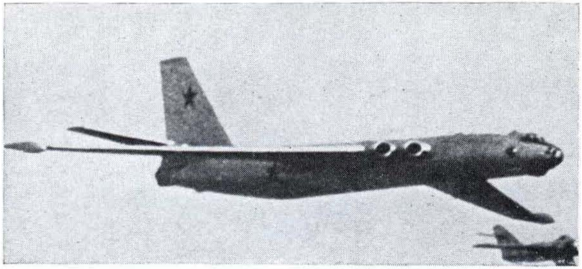
Now serving with the East German and Sino-Communist air arms, the MiG-21 equips most I.A.-P.V.O. squadrons, and is currently the most important Russian interceptor. First flown in 1955–6, the MiG-21 entered service in 1958–9.

Nationality: Russian. **Type:** Single-seat Interceptor. **Power Plant:** One 18,000 lb.s.t. (22,400 lb. with afterburning) Mikulin AM-3 turbojet. **Armament:** One 37-mm. and two 23-mm. guns plus four M-100A missiles. **Weights:** Empty, 15,456 lb.; loaded, 30,240 lb. **Performance:** Max. speed, 1,685 m.p.h. at 33,000 ft. (Mach 2·25); cruising, 608 m.p.h. at 41,000 ft.; initial climb, 45,100 ft./min.; service ceiling, 61,000 ft. **Dimensions:** Span, 29 ft.; length, 56 ft. 4¾ in.; height, 14 ft. 9½ in.; wing area, 363·8 sq. ft.

MYASISHCHEV (BISON)

Designed by a team headed by V. M. Myasishchev, the Bison entered service with the *Dalnaya Aviatsiya* in 1955–6, although it was reported to have been less successful than anticipated, and only some 200–300 are believed to have been built.

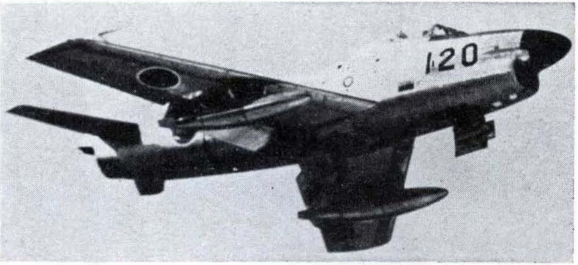
Nationality: Russian. **Type:** Long-range Heavy Bomber. **Power Plants:** Four 19,180 lb.s.t. Mikulin AM-3M turbojets. **Armament:** Three 23-mm. cannon and 20,000-lb. bomb load. **Weights:** Loaded, 352,750 lb. **Performance:** Approx. max. speed, 620 m.p.h. at 10,000 ft. (Mach 0·85), 560 m.p.h. at 40,000 ft.; cruising, 480 m.p.h. at 36,000 ft.; range (20,000-lb. bomb load), 3,000 mls., (10,000-lb), 7,000 mls.; service ceiling, 40,000 ft. **Dimensions:** Span, 170 ft.; length, 162 ft.; height, 50 ft.; wing area, 3,660 sq. ft.



NORTH AMERICAN F-86D SABRE

Employed by the air forces of Denmark, Japan, South Korea and the Philippines, the F-86D was the first all-weather variant of the Sabre, and the first service fighter to adopt an all-missile armament. The prototype flew on December 22, 1949, and the last production F-86D was delivered in September 1955.

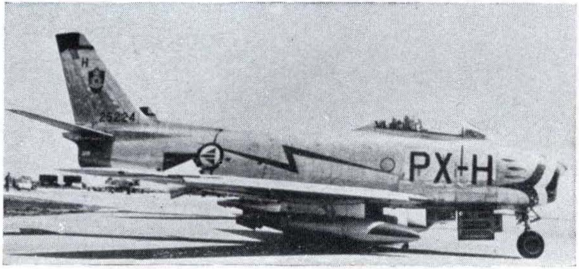
Nationality: American. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 5,600 lb.s.t. (7,650 lb. with afterburning) General Electric J47-GE-33 turbojet. **Armament:** Twenty-four 2·75-in. missiles. **Weights:** Empty, 11,905 lb.; normal loaded, 18,740 lb.; max., 20,547 lb. **Performance:** Max. speed, 667 m.p.h. at 10,000 ft. (Mach 0·91); cruising, 351 m.p.h. at 30,000 ft.; initial climb, 17,800 ft./min. **Dimensions:** Span, 37 ft. 1 in.; length, 40 ft. 4 in.; height, 15 ft.; wing area, 287·9 sq. ft.

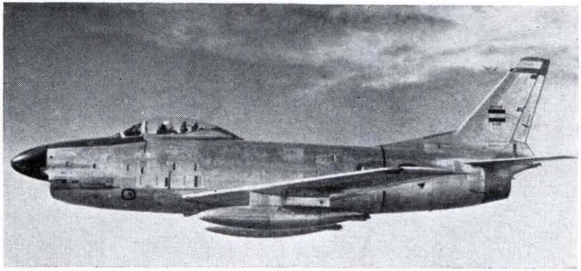


NORTH AMERICAN F-86F SABRE

The final day fighter production version of the Sabre, the F-86F is a progressive development of the F-86E (see CL-13 Sabre Mk. 4, page 204), embodying structural redesign and a more powerful engine. Three hundred F-86F-40-NA Sabres were manufactured under licence in Japan for the J.A.S.D.F.

Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 6,100 lb.s.t. General Electric J47-GE-27 turbojet. **Armament:** Six 0·5-in. guns. **Weights:** Empty, 10,950 lb.; loaded, 19,600 lb.; max., 20,194 lb. **Performance:** Max. speed, 656 m.p.h. at sea level, 602 m.p.h. at 20,000 ft.; cruising, 328 m.p.h. at 30,000 ft.; time to 30,000 ft., 11 min.; range (standard tankage), 888 mls. **Dimensions:** Span, 37 ft. 1 in.; length, 37 ft. 6 in.; height, 14 ft. 7 in.; wing area, 287·9 sq. ft.

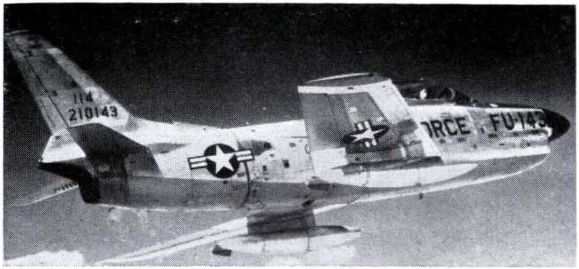




NORTH AMERICAN F-86K SABRE

Serving with France, Italy, Netherlands, W. Germany and Norway, the F-86K was ordered by the U.S.A.F. with M.D.A.P. funds for delivery to N.A.T.O. countries. Developed from the F-86D, it has an 8-in. increase in length and cannon in place of the missile tray. Fiat built 231 and others were built by N.A.

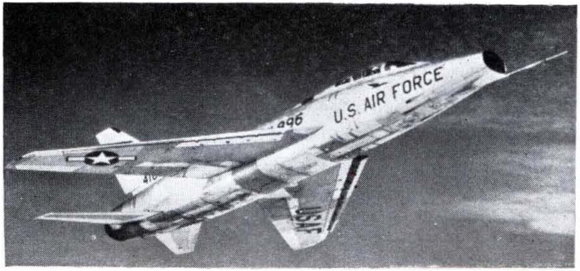
Nationality: American. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 5,425 lb.s.t. (7,450 lb. with afterburning) General Electric J47-GE-17B turbojet. **Armament:** Four 20-mm. cannon. **Weights:** Normal loaded, 18,500 lb.; max., 20,347 lb. **Performance:** Max. speed, 657 m.p.h. at 10,000 ft. (Mach 0·9); initial climb, 16,000 ft./min.; range (max. external tankage), 795 mls., (standard), 603 mls. **Dimensions:** Span, 37 ft. 1 in.; length, 41 ft.; height, 15 ft.; wing area, 287·9 sq. ft.



NORTH AMERICAN F-86L SABRE

Currently being phased out of service with the Air National Guard, the F-86L is a re-worked version of the F-86D, modifications including a new slotted wing leading-edge, extended wing-tips, and the installation of " Data Link " equipment. The F-86L has now been largely replaced by the F-102A.

Nationality: American. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 5,600 lb.s.t. (7,650 lb. with afterburning) General Electric J47-GE-33 turbojet. **Armament:** Twenty-four 2·75-in. missiles. **Weights:** Loaded, 19,200 lb.; max., 20,600 lb. **Performance:** Max. speed, 707 m.p.h. at sea level (Mach 0·927), 625 m.p.h. at 35,000 ft.; range (max. external tankage), 795 mls.; absolute ceiling, 54,600 ft. **Dimensions:** Span, 39 ft. 1 in.; length, 40 ft. 4 in.; height, 15 ft.



NORTH AMERICAN F-100D SUPER SABRE

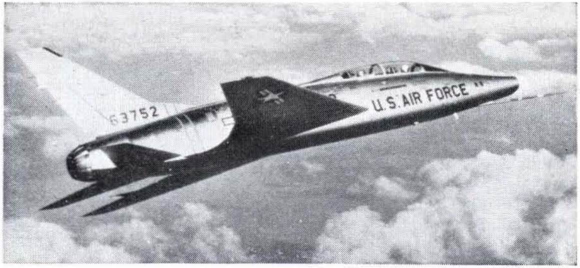
Shortly to be supplanted by the F-105D in the U.S.A.F. Tactical Air Command, the F-100D serves with the Armée de l'Air, and the Danish, Turkish and Greek air forces. The F-100D was the final production model of the Super Sabre, 2,294 examples of which were built. The F-100D first flew on January 24, 1956.

Nationality: American. **Type:** Single-seat Tactical Fighter-bomber. **Power Plant:** One 11,700 lb.s.t. (16,950 lb. with a/b) Pratt and Whitney J57-P-21A. **Armament:** Four 20-mm. cannon and 7,500-lb. external ordnance. **Weights:** Empty, 21,000 lb.; loaded, 29,762 lb.; max., 34,832 lb. **Performance:** Max. speed, 864 m.p.h. at 35,000 ft. (Mach 1·3); cruising, 565 m.p.h. at 36,000 ft.; initial climb, 16,000 ft./min. **Dimensions:** Span, 38 ft. 9⅓ in.; length, 54 ft. 3 in.; height, 16 ft. 2⅔ in.; wing area, 385·2 sq. ft.

NORTH AMERICAN F-100F SUPER SABRE

Suitable for use as fighter-bomber, air superiority fighter or conversion trainer, the F-100F serves with the U.S.A.F. and several N.A.T.O. air arms as well as the Nationalist Chinese. The first F-100F flew on March 7, 1957, production being completed in October 1959.

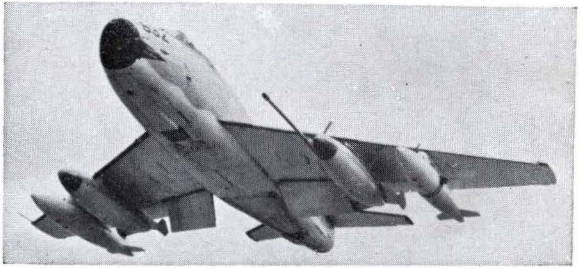
Nationality: American. **Type:** Two-seat Combat Proficiency Trainer and Fighter-bomber. **Power Plant:** One 11,700 lb.s.t. (16,950 lb. with afterburning) Pratt and Whitney J57-P-21A turbojet. **Armament:** Two 20-mm. cannon and 6,000-lb. external ordnance load. **Weights:** Empty, 21,346 lb.; max., 34,235 lb. **Performance:** Max. speed, 864 m.p.h. at 35,000 ft. (Mach 1·3); tactical, radius 570 mls. **Dimensions:** Span, 38 ft. 9⅓ in.; length, 57 ft. 3 in.; height, 16 ft. 2⅔ in.; wing area, 385·2 sq. ft.



NORTH AMERICAN FJ-4B FURY

Although evolved from the FJ-3, a shipboard variant of the land-based Sabre, the FJ-4 Fury embodied so much redesign that it was virtually a new aircraft. The FJ-4 first flew on October 28, 1954, and the attack fighter version, the FJ-4B, flew on December 3, 1956. The experimental FJ-4F has an AR-1 bi-fuel rocket.

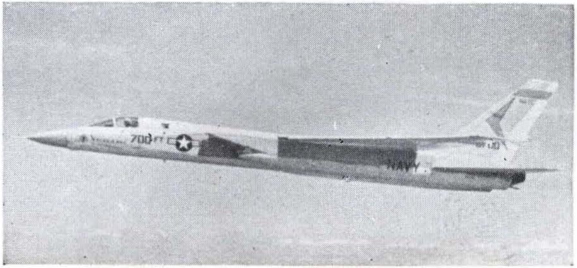
Nationality: American. **Type:** Single-seat Shipboard Close-support Fighter-bomber. **Power Plant:** One 7,700 lb.s.t. Wright J65-W-16A turbojet. **Armament:** Four 20-mm. cannon and six Sidewinder or Bullpup missiles. **Weight:** Normal loaded, 19,900 lb. **Performance:** Max. speed, 687 m.p.h. at sea level (Mach 0·9); initial climb, 7,500 ft./min.; max. range (max. external fuel), 2,700 mls. **Dimensions:** Span, 39 ft. 1 in.; length, 36 ft. 6 in.; height, 13 ft. 11 in.; wing area, 338 sq. ft.

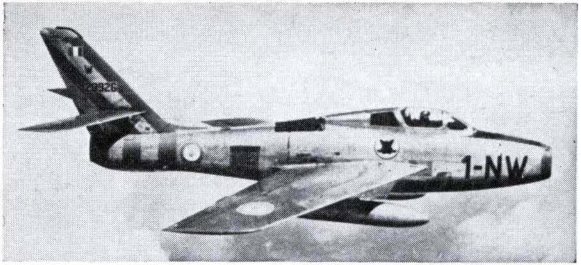


NORTH AMERICAN A3J-1 VIGILANTE

The Vigilante, which established a new international record on December 13, 1960, by carrying a 1,000-kg. load (2,204·6 lb.) to 91,451 ft., is shortly to enter service with the U.S. Navy. Capable of carrying any store up to a maximum of 6,000 lb., the production Vigilante will have uprated J79-GE-8 turbojets.

Nationality: American. **Type:** Two-seat Shipboard Attack Bomber. **Power Plants:** Two 10,350 lb.s.t. (16,150 lb. with afterburning) General Electric J79-GE-4 turbojets. **Armament:** Nuclear or conventional weapons in an axial weapons bay. **Weight:** Loaded, 49,500 lb. **Performance:** Approx. max. speed, 1,385 m.p.h. at 40,000 ft. (Mach 2·1); normal range, 2,300 mls.; service ceiling, 70,000 ft.; zoom climb altitude, 95,000 ft. **Dimensions:** Span, 53 ft.; length, 73 ft.; height, 20 ft.

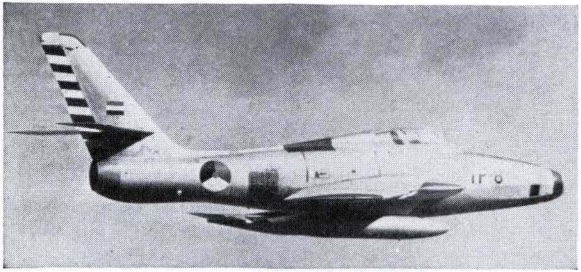




REPUBLIC F-84F THUNDERSTREAK

Currently providing the backbone of N.A.T.O.'s tactical fighter-bomber force, and serving with squadrons of the French, Belgian, Dutch, West German, Italian and Greek air forces, the F-84F stems from the F-84E Thunderjet but there is little similarity between the two machines. A total of 2,711 was built.

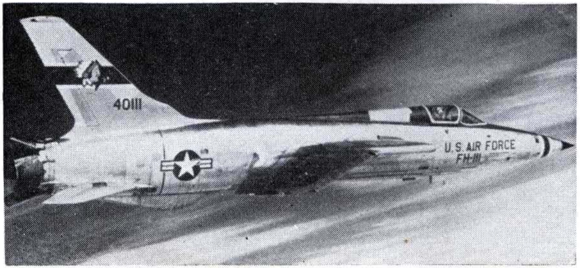
Nationality: American. **Type:** Single-seat Tactical Fighter-bomber. **Power Plant:** One 7,220 lb.s.t. Wright J65-W-3 turbojet. **Armament:** Six 0·5-in. guns and 6,000-lb. external ordnance load. **Weights:** Loaded (clean), 19,340 lb. (with max. external fuel), 26,030 lb.; max., 28,000 lb. **Performance:** Max. speed, 695 m.p.h. at sea level (Mach 0·91), 658 m.p.h. at 20,000 ft. (Mach 0·94); initial climb, 8,200 ft./min. **Dimensions:** Span, 33 ft. 7¼ in.; length, 43 ft. 4¾ in.; height, 14 ft. 4¾ in.



REPUBLIC RF-84F THUNDERFLASH

Developed in parallel with the F-84F, the RF-84F has a radically changed air intake duct location to permit the installation of a six-camera bay in the nose. Production of the RF-84F was completed in January 1957, some 700 machines being built. It serves with several N.A.T.O. air forces.

Nationality: American. **Type:** Single-seat Reconnaissance-fighter. **Power Plant:** One 7,800 lb.s.t. Wright J65-W-7 turbojet. **Armament:** Four 0·5-in. guns. **Performance:** Max. speed, 679 m.p.h. at sea level (Mach 0·89), 607 m.p.h. at 35,000 ft. (Mach 0·92); initial climb, 8,000 ft./min.; service ceiling, 46,000 ft.; range (with max. external fuel), 2,200 mls.; combat radius (clean), 600 mls. **Dimensions:** Span, 33 ft. 7¼ in.; length, 47 ft. 7¾ in.; height, 15 ft.



REPUBLIC F-105D THUNDERCHIEF

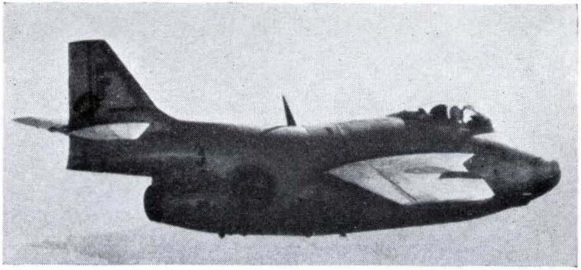
Now in process of replacing the F-100D in U.S.A.F.E., the F-105D is the current production model of the Thunderchief. Seventy-five examples of the earlier F-105B (illustrated) preceded the F-105D on the production line, these having the J75-P-5 turbojet offering a maximum afterburning thrust of 23,500 lb.

Nationality: American. **Type:** Single-seat All-weather Strike Fighter. **Power Plant:** One 17,200 lb.s.t. (26,500 lb. with a/b) Pratt and Whitney J75-P-19W turbojet. **Armament:** One 20-mm. rotary cannon and 11,000-lb. external ordnance load. **Weights:** Empty, 27,500 lb.; loaded, 35,200–48,400 lb. **Performance:** Max. speed, 952 m.p.h. at sea level, 1,420 m.p.h. at 36,000 ft. (Mach 2·15). **Dimensions:** Span, 34 ft. 11 in.; length, 64 ft. 3 in.; height, 19 ft. 8 in.; wing area, 385 sq. ft.

SAAB-29F

Equipping five Flygvapnet day fighter wings and now entering service with the Austrian Air Force, the SAAB-29F was the final production version of the first European swept-wing fighter. A photographic-reconnaissance version without an afterburner, the SAAB-29C, serves with Flottiljer 11 and 21.

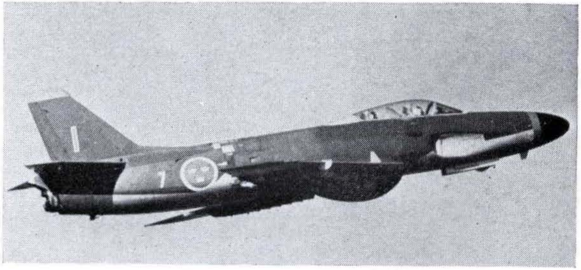
Nationality: Swedish. **Type:** Single-seat Interceptor and Fighter-bomber. **Power Plant:** One 4,750 lb.s.t. (6,170 lb. with a/b) S.F.A. RM 2B turbojet. **Armament:** Four 20-mm. cannon and twenty-four 75-mm. rockets. **Weights:** Empty, 10,141 lb.; max., 17,637 lb. **Performance:** Max. speed, 658 m.p.h. at 5,000 ft. (Mach 0·86); initial climb, 11,810 ft./min.; service ceiling, 50,850 ft.; range (max. fuel), 1,678 mls. **Dimensions:** Span, 36 ft. 1 in.; length, 33 ft. $2\frac{1}{2}$ in.; height, 12 ft. $3\frac{1}{2}$ in.; wing area, 258 sq. ft.



SAAB-32A LANSEN

The Lansen (Lance) entered service with the Flygvapnet in 1955, and all Swedish attack wings currently operate this type. A photographic-reconnaissance version is designated SAAB-32C. The Lansen flew for the first time on November 3, 1952, and production of the attack variant was completed in mid-1958.

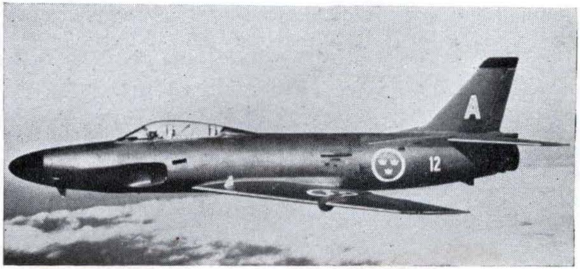
Nationality: Swedish. **Type:** Two-seat All-weather Attack Aircraft. **Power Plant:** One 8,050 lb.s.t. (9,920 lb. with a/b) S.F.A. RM 5 turbojet. **Armament:** Four 20-mm. cannon and four 550-lb. or two 1,100-lb. bombs. **Weights:** Approx. empty, 16,535 lb.; max., 28,660 lb. **Performance:** Max. speed, 700 m.p.h. at sea level (Mach 0·92); initial climb, 11,800 ft./min.; service ceiling, 49,200 ft. **Dimensions:** Span, 42 ft. $7\frac{3}{4}$ in.; length, 48 ft. $0\frac{3}{4}$ in.; height, 15 ft. 7 in.; wing area, 402·5 sq. ft.

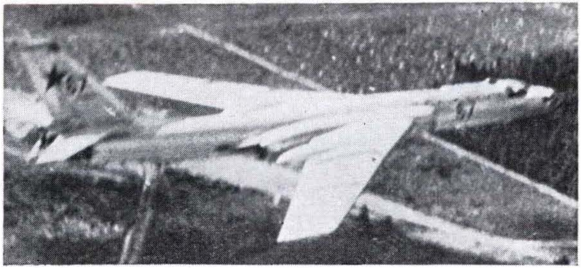


SAAB-32B LANSEN

Standard Flygvapnet night and all-weather fighter, the SAAB-32B is a more powerful, more heavily armed version of the Lansen, combining 30-mm. cannon with a SAAB S6 all-weather fire control system. It carries some 220 lb. more electronic equipment than the SAAB-32A and may be fitted with Sidewinders.

Nationality: Swedish. **Type:** Two-seat Night and All-weather Interceptor. **Power Plant:** One 11,250 lb.s.t. (15,190 lb. with afterburning) S.F.A. RM 6 turbojet. **Armament:** Four 30-mm. cannon and two pods of nineteen 75-mm. rockets. **Weights:** Approx. empty, 16,500 lb.; loaded, 23,000 lb. **Performance:** Approx. max. speed, 700 m.p.h. at sea level (Mach 0·92); max. climb, 19,685 ft./min.; ceiling, 52,500 ft. **Dimensions:** Span, 42 ft. $7\frac{3}{4}$ in.; length, 47 ft. $6\frac{3}{4}$ in.; height, 15 ft. 3 in.; wing area, 402·57 sq. ft.

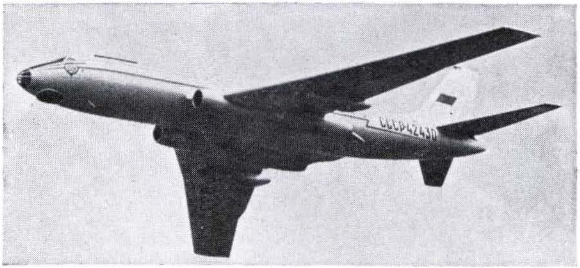




TUPOLEV TU-16 (BADGER)

The Tu-16 has been the standard Soviet long-range medium bomber for some seven years and is now being supplemented by the supersonic *Bounder* (illustrated on page 231). The Tu-16 is also used by shore-based elements of the Soviet Navy for anti-shipping duties with air-to-surface homing missiles underwing.

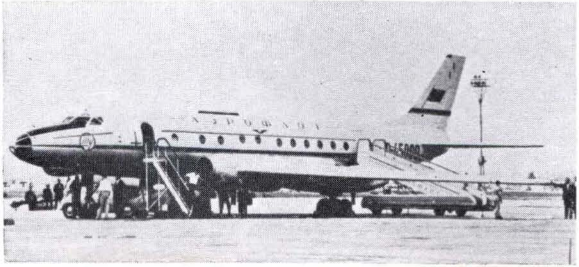
Nationality: Russian. **Type:** Long-range Medium Bomber. **Power Plants:** Two 19,180 lb.s.t. Mikulin AM-3M turbojets. **Armament:** Three 23-mm. cannon and up to 10,000 lb. of bombs. **Weight:** Approx. loaded, 170,000 lb. **Performance:** Max. speed, 620 m.p.h. at 10,000 ft. (Mach 0·85), 610 m.p.h. at 20,000 ft.; max. range with 7,000-lb. offensive load, 4,250 mls.; service ceiling, 38,000 ft. **Dimensions:** Span, 111 ft.; length, 118 ft.; height, 36 ft.; wing area, 1,825 sq. ft.



TUPOLEV TU-104B (CAMEL)

Russia's first commercial jet aircraft, the Tu-104 flew for the first time on June 17, 1955, entering service on September 15, 1956. The Tu-104B is the third production version, the original Tu-104 carrying fifty passengers, and the Tu-104A accommodating up to seventy. Both have a length of 126 ft. $3\frac{3}{4}$ in.

Nationality: Russian. **Type:** Medium-range Commercial Transport. **Power Plants:** Two 15,000 lb.s.t. Mikulin RD-3M turbojets. **Accommodation:** 100 passengers. **Weights:** Max. payload, 26,455 lb.; max. loaded, 166,000 lb. **Performance:** Max. speed, 614 m.p.h. at 30,000 ft. (Mach 0·91); max. cruising, 560 m.p.h.; range cruising, 500 m.p.h. at 32,800–39,400 ft.; range (max. payload), 1,860 mls. **Dimensions:** Span, 113 ft. $3\frac{3}{4}$ in.; length, 130 ft. 3 in.; height, 39 ft. $4\frac{1}{2}$ in.; wing area, 2,023·61 sq. ft.



TUPOLEV TU-124

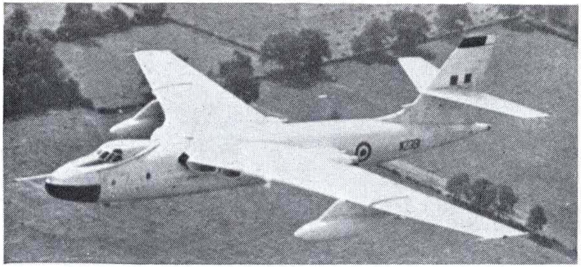
The Tu-124, the prototype of which appeared early in 1960, is reportedly in quantity production for use by Aeroflot on express inter-city services, and is the first Russian transport aircraft to be powered by turbofan engines. Designed by A. A. Arkhangelskii, a senior member of the Tupolev design bureau, the Tu-124 bears a close family resemblance to the previously described Tu-104, and three versions are to be produced.

Nationality: Russian. **Type:** Medium-range Commercial Transport. **Power Plants:** Two Soloviev turbofans. **Accommodation:** 44–68 passengers. **Weights:** No details available. **Performance:** Max. speed, 620 m.p.h.; average cruising (over stages of approx. 920 mls.), 560 m.p.h. at 33,000 ft. **Dimensions:** No details available for publication.

VICKERS VALIANT B.K.1

The first of the R.A.F.'s V-class bombers, and currently equipping Nos. 7, 18, 49, 90, 138, 148, 207, and 214 Squadrons of Bomber Command, the Valiant entered service early in 1955, and one hundred and four production machines and three prototypes had been built when the last was delivered on August 27, 1957.

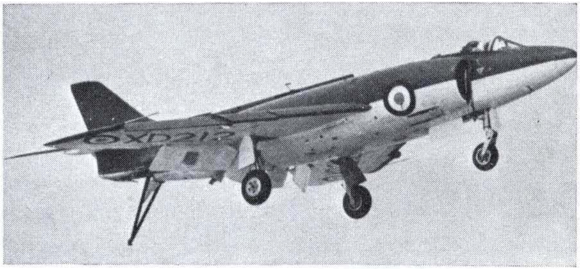
Nationality: British. **Type:** Medium Bomber. **Power Plants:** Four 10,050 lb. s.t. Rolls-Royce Avon 204 turbojets. **Weights:** Empty, 75,881 lb.; loaded, 140,000 lb.; max., 175,000 lb. **Performance:** (At 140,000 lb.) Max. speed, 567 m.p.h. at 30,000 ft. (Mach 0·84), 414 m.p.h. at sea level; max. cruising, 553 m.p.h. at 30,000 ft. (Mach 0·82); econ. cruising, 495 m.p.h. at 36,000 ft.; range, 3,450 mls.; max., 4,500 mls. **Dimensions:** Span, 114 ft. 4 in.; length, 108 ft. 3 in.; height, 32 ft. 2 in; wing area, 2,362 sq.ft.



VICKERS-SUPERMARINE SCIMITAR F.1

The Scimitar first flew on January 20, 1956, and the last of seventy-six machines was delivered in September 1960. Among Fleet Air Arm squadrons currently operating the Scimitar are Nos. 736, 764, 800, 803, 804 and 807, and the original armament of four 30-mm. cannon is now being replaced by Sidewinders.

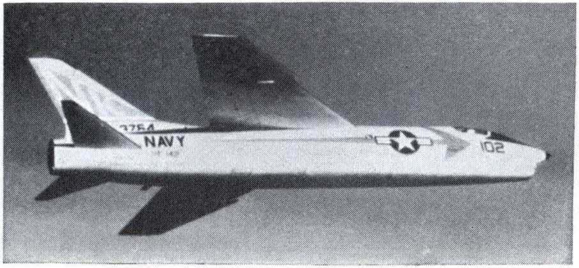
Nationality: British. **Type:** Single-seat Shipboard Day Fighter and Strike Aircraft. **Power Plants:** Two 11,250 lb.s.t. Rolls-Royce Avon 202 turbojets. **Armament:** Four Sidewinders or four 500-lb. or 1,000-lb bombs. **Weight:** Normal loaded, 33,000–35,000 lb. **Performance:** Approx. max. speed, 710 m.p.h. at 10,000 ft. (Mach 0·97); approx. radius (standard tankage), 200–250 mls.; ceiling, 50,000 ft. **Dimensions:** Span, 37 ft. 2 in.; length, 55 ft. 4 in.; height, 15 ft. 3 in.

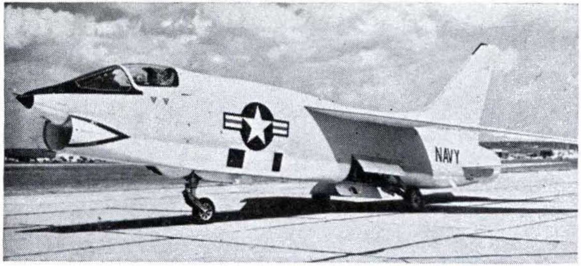


CHANCE VOUGHT F8U-1 CRUSADER

The XF8U-1 was first flown on March 25, 1955, and the first production model, the F8U-1, followed on September 30, 1955. The first few dozen production machines received the J57-P-12 which gave an afterburning thrust of 14,500 lb. This was supplanted by the more powerful J57-P-4A.

Nationality: American. **Type:** Single-seat Shipboard Day Interceptor. **Power Plant:** One 16,200 lb.s.t. (afterburning) Pratt and Whitney J57-P-4A turbojet. **Armament:** Four 20-mm. cannon and thirty-two 2·75-in. rockets. **Weight:** Approx. max. loaded, 27,000 lb. **Performance:** Max. speed, 1,090 m.p.h. at 40,000 ft. (Mach 1·65); cruising, 725 m.p.h. at 35,000 ft.; max. climb, 20,000+ ft./min.; service ceiling, 60,000 ft. **Dimensions:** Span, 35 ft. 8 in.; length, 54 ft. 3 in.; height, 15 ft. 9 in.

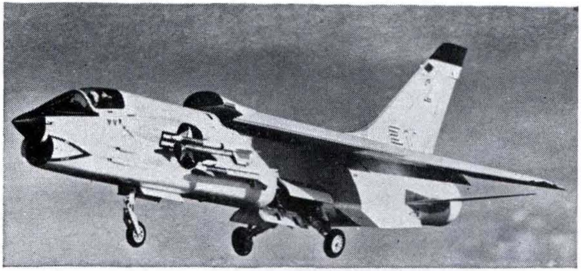




CHANCE VOUGHT F8U-1P CRUSADER

A photographic-reconnaissance version of the original F8U-1 which was phased out of production in 1959, the F8U-1P embodies extensive fuselage redesign in order to accommodate three trimetrogen and two vertical cameras with optically-flat panels. The first U.S. Navy squadron to receive the F8U-1P was VFP-61.

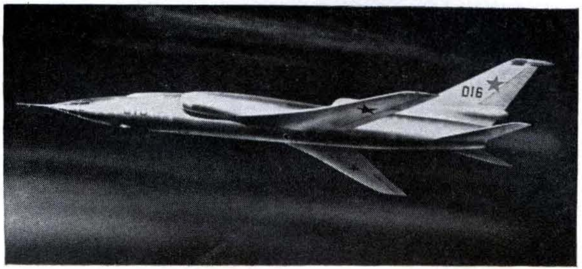
Nationality: American. **Type:** Single-seat Tactical Reconnaissance Shipboard Aircraft. **Power Plant:** One 16,200 lb.s.t. (afterburning) Pratt and Whitney J57-P-4A turbojet. **Weight:** Approx. max. loaded, 27,000 lb. **Performance:** Max. speed, 1,090 m.p.h. at 40,000 ft. (Mach 1·65); cruising, 725 m.p.h. at 35,000 ft.; max. climb rate, 20,000 + ft./min.; service ceiling, 60,000 ft.; tactical radius (standard tankage), 300 mls. **Dimensions:** Span, 35 ft. 8 in.; length, 54 ft. 3 in.; height, 15 ft. 9 in.



CHANCE VOUGHT F8U-2N CRUSADER

A limited all-weather development of the F8U-2 day fighter, the F8U-2N features increased internal fuel capacity, revised instrumentation, new and more powerful search and tracking radar and a J57-P-20 in place of the J57-P-16 (16,900 lb. with afterburning). The F8U-2N flew on June 1, 1960.

Nationality: American. **Type:** Single-seat Shipboard Interceptor. **Power Plant:** One 18,000 lb.s.t. (with afterburning) Pratt and Whitney J57-P-20 turbojet. **Armament:** Four 20-mm. cannon and two or four Sidewinders. **Weight:** Approx. max. loaded, 29,000 lb. **Performance:** Max. speed, 1,300 m.p.h. at 40,000 ft. (Mach 1·97); max. climb rate, 25,000 + ft./min.; service ceiling, 55,000–60,000 ft. **Dimensions:** Span, 35 ft. 8 in.; length, 54 ft. 3 in.; height, 15 ft. 9 in.



YAKOVLEV YAK-42 (BACKFIN)

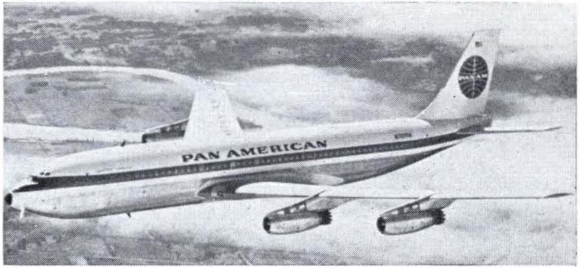
A supersonic light tactical bomber intended to succeed the Il-28, the Yak-42 was first flown in 1956, and a number of squadrons are now operational. Defensive armament includes a remotely-controlled tail barbette housing a single cannon, and for the ground-attack rôle air-to-surface missiles are carried underwing.

Nationality: Russian. **Type:** Light Tactical Bomber. **Power Plants:** Two 20,240 lb.s.t. (26,400 lb. with afterburning) Mikulin M-209 turbojets. **Weights:** Empty, 48,400 lb.; max., 88,660 lb. **Performance:** Max. speed, 975 m.p.h. at 40,000 ft. (Mach 1·48), 838 m.p.h. at sea level; initial climb, 24,600 ft./min.; max. ceiling, 50,500 ft.; range, 1,500 mls.; endurance, 2·5 hrs. **Dimensions:** Span, 80 ft. 4¾ in.; length, 101 ft. 8½ in.; height, 26 ft. 6 in.; wing area, 1,016·8 sq. ft.

BOEING 707-120

The basic civil production version of the Model 707 airliner, the Model 707-120 is intended primarily for continental use, and the first production machine flew on December 20, 1957. Retrofitted with 17,000 lb.s.t. JT3D-1 turbofans and a new inboard wing leading edge, the Model 707-120 becomes the -120B.

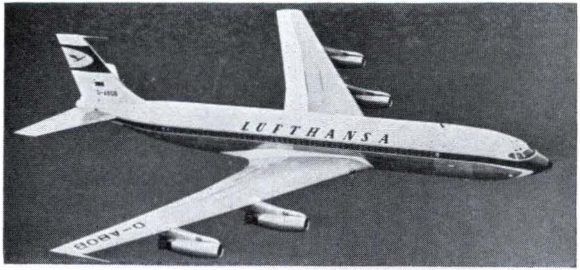
Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 13,000 lb.s.t. Pratt and Whitney JT3C-6 turbojets. **Accommodation:** 121–179 passengers. **Weights:** Basic 112,800 lb.; max. payload, 52,200 lb.; max. loaded, 247,000 lb. **Performance:** Max. cruising, 585 m.p.h. at 25,000 ft.; range (with 43,850 lb.), 3,750 mls. at 526 m.p.h. at 36,000 ft.; (max. payload), 3,330 mls. **Dimensions:** Span, 130 ft. 10 in.; length, 144 ft. 6 in.; height, 41 ft. 8 in.; wing area, 2,433 sq. ft.



BOEING 707-420

An enlarged long-range over-water version of the basic Model 707, the Model 707-420 Intercontinental differs from the Model 707-320 solely in the type of engines installed, the -320 having 16,800 lb.s.t. Pratt and Whitney JT4A-9 turbojets. The -420 serves with B.O.A.C., Air India, Lufthansa and Varig.

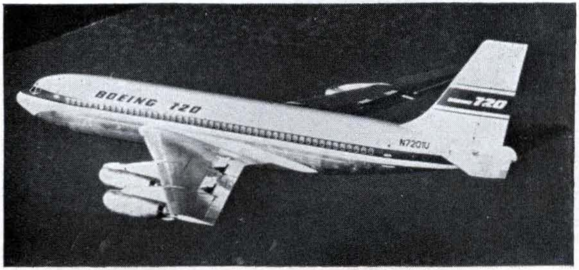
Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 17,500 lb.s.t. Rolls-Royce Conway R.Co.12 turbojets. **Accommodation:** 131–189 passengers. **Weights:** Basic, 113,700 lb.; max. payload, 58,800 lb.; max. loaded, 311,000 lb. **Performance:** Max. cruising, 603 m.p.h. at 25,000 ft.; range (with 19,630 lb.), 6,955 mls. at 522 m.p.h. at 39,000 ft., (max. payload), 4,710 mls. **Dimensions:** Span, 142 ft. 5 in.; length, 152 ft. 11 in.; height, 38 ft. 8 in.; wing area, 2,892 sq. ft.

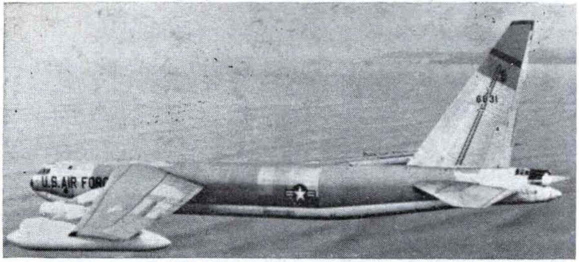


BOEING 720-020

Smallest of the current Boeing family of commercial transports, the Model 720 is, from the weight and structural viewpoints, a completely new design despite its external similarity to the Model 707. Various refinements are incorporated, and the Model 720B has 17,000 lb.s.t. Pratt and Whitney JT3D-1 turbofans.

Nationality: American. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 12,000 lb.s.t. Pratt and Whitney JT3C-7 turbojets. **Accommodation:** 110–165 passengers. **Weights:** Basic, 99,919 lb.; max. payload, 37,000 lb.; max. loaded, 203,000 lb. **Performance:** Max. cruising, 600 m.p.h. at 25,000 ft.; range cruising, 535 m.p.h. at 40,000 ft.; range (max. payload), 3,005 mls., (max. fuel), 4,260 mls. **Dimensions:** Span, 130 ft. 10 in.; length, 136 ft. 2 in.; height, 38 ft. 4 in.; wing area, 2,433 sq. ft.

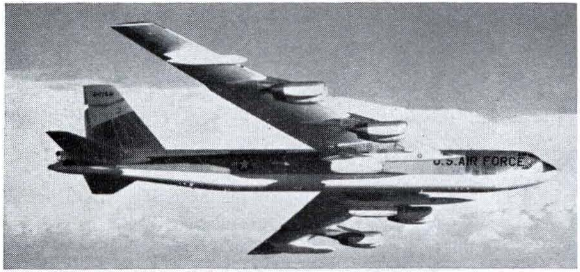




BOEING B-52E STRATOFORTRESS

The B-52E, which first flew on October 3, 1957, is representative of the initial production series of Stratofortresses. Three B-52As and thirty B-52Bs were followed by 323 B-52C, D, E and F Stratofortresses. The B-52E differs from the "D" in having improved bombing, navigation and electronics systems, and the B-52F, which flew on May 6, 1958, has J57-P-43W engines.

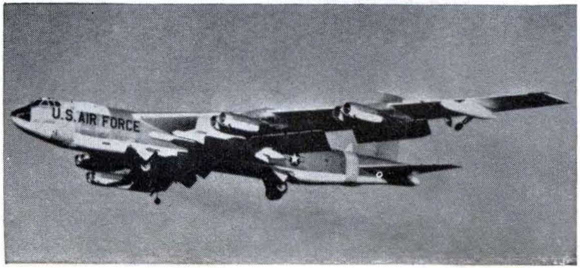
Nationality: American. **Type:** Long-range Heavy Bomber. **Power Plants:** Eight 10,900 lb.s.t. (12,500 lb. wet) Pratt and Whitney J57-P-29W turbojets. **Armament:** Two 20-mm. cannon and (max.) 75,000 lb. bombs. **Weight:** Max. 450,000 lb. **Performance:** Max. speed, 612 m.p.h. at 40,000 ft.; service ceiling, 47,000 ft.; max. range, 7,500 mls. **Dimensions:** Span, 185 ft.; length, 152 ft. 9 in.; height, 48 ft. 3 in.; wing area, 4,000 sq. ft.



BOEING B-52G STRATOFORTRESS

The 357th production Stratofortress which flew on October 26, 1958, differed from previous machines in having a redesigned wing forming an integral fuel tank, revised structure and control surfaces, and shorter vertical tail surfaces. This was the first B-52 G missile carrier, the 245th and last being completed in 1960.

Nationality: American. **Type:** Long-range Strategic Heavy Bomber and Missile Carrier. **Power Plants:** Eight 11,200 lb.s.t. (13,750 lb. wet) Pratt and Whitney J57-P-43W turbojets. **Armament:** Two Hound Dog missiles, various internal bomb loads and four 0·5-in. guns. **Weights:** Max. loaded, 488,000 lb. **Performance:** Max. speed, 665 m.p.h. at 20,000 ft. (Mach 0·95); max. ceiling, 59,000 ft. **Dimensions:** Span, 185 ft.; length, 157 ft. 6⅞ in.; height, 40 ft. 8 in.; wing area, 4,000 sq. ft.



BOEING B-52H STRATOFORTRESS

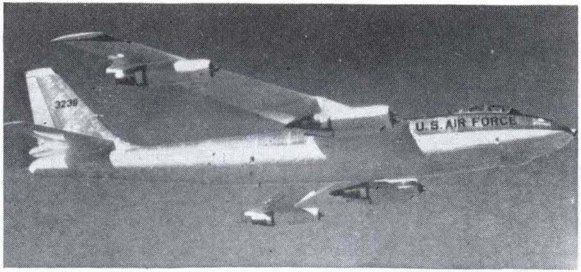
The current production version of the Stratofortress and built specifically as a launching platform for the Skybolt ballistic missile, the B-52H has turbofan engines which offer 12% better fuel consumption and permit elimination of 10,000 lb. of water injection equipment. Six S.A.C. wings of sixteen B-52H Stratofortresses will be in service in 1962, the first being the 379th.

Nationality: American. **Type:** Long-range Strategic Heavy Bomber and Missile Carrier. **Power Plants:** Eight 17,000 lb.s.t. Pratt and Whitney TF-33-P-3 turbofans. **Armament:** Four Skybolt missiles, and a 20-mm. rotary cannon. **Weight:** Max. loaded, 490,000 lb. **Performance:** Max. speed, 627 m.p.h. at 40,000 ft.; max. range, 10,000 mls. **Dimensions:** Span, 185 ft.; length, 158 ft.; height, 40 ft. 8 in.; wing area, 4,000 sq. ft.

BOEING B-47E-II STRATOJET

Some thirteen U.S.A.F. Strategic Air Command wings are each currently equipped with forty-five B-47E-II Stratojets, these having been structurally modified to extend their useful life by some 3,000 hours and suit them for low-altitude operations. A day or night long-range photo-reconnaissance version is the RB-47E.

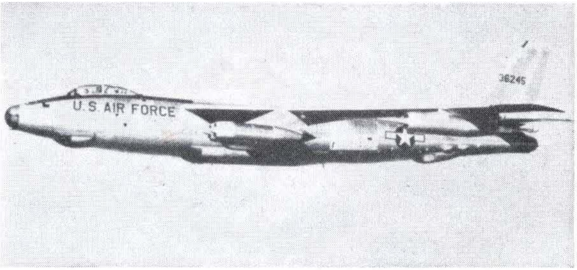
Nationality: American. **Type:** Long-range Medium Bomber. **Power Plants:** Six 5,970 lb.s.t. (7,200 lb. wet) General Electric J47-GE-25A turbojets. **Armament:** Two 20-mm. cannon and up to 20,000 lb. bomb load. **Weights:** Normal loaded, 175,000 lb.; max., 202,000 lb. **Performance:** Max. speed, 630 m.p.h. at 10,000 ft. (Mach 0·86), 650 m.p.h. at 20,000 ft. (Mach 0·93); max. range (standard tankage), 3,200 mls. at 38,000 ft. **Dimensions:** Span, 116 ft.; length, 109 ft. 10 in.; height, 27 ft. 11 in.



BOEING RB-47H STRATOJET

The RB-47H is a "special" reconnaissance version of the B-47E which is employed for oblique radar mapping and reconnaissance, and the monitoring of radio and radar transmissions. The bomb-bay is replaced by a pressurised compartment for three electronics operators, increasing the crew to a total of six.

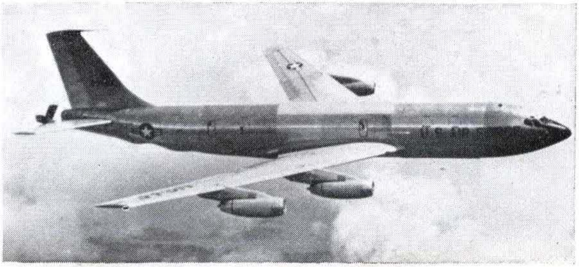
Nationality: American. **Type:** Long-range Radar and Photographic Reconnaissance Aircraft. **Power Plants:** Six 5,970 lb.s.t. (7,200 lb. wet) General Electric J47-GE-25A turbojets. **Armament:** Two 20-mm. cannon. **Weight:** Approx. normal loaded, 190,000 lb. **Performance:** Max. speed, 650 m.p.h. at 20,000 ft. (Mach 0·93); max. range (standard tankage), 3,200 mls. at 495 m.p.h. at 38,000 ft. **Dimensions:** Span, 116 ft.; length, 109 ft. 10 in.; height, 27 ft. 11 in.; wing area, 1,400 sq. ft.

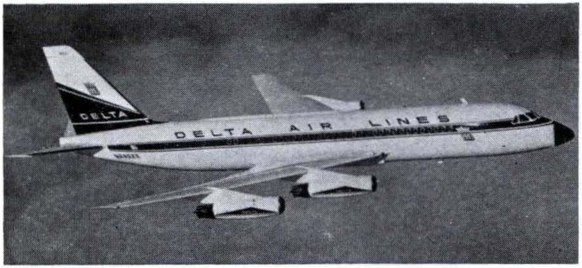


BOEING KC-135A STRATOTANKER

Of basically similar design to the commercial Model 707, the KC-135A serves in substantial numbers with the U.S.A.F. Strategic Air Command, one squadron being attached to every Heavy Bomber Wing. Fuselage tanks house 10,880 U.S. gal. of fuel and up to 145 passengers or a 50,000-lb. freight load may be carried. Some are used as flying command posts.

Nationality: American. **Type:** Convertible Tanker-transport. **Power Plants:** Four 11,800 lb.s.t. (13,500 lb. wet) Pratt and Whitney J57-P-31 turbojets. **Weight:** Max. loaded, 297,000 lb. **Performance:** Max. speed, 630 m.p.h. at 25,000 ft.; cruising, 590 m.p.h. at 35,000 ft.; max. continuous cruising 540 m.p.h.; service ceiling, 45,000 ft. **Dimensions:** Span, 130 ft. 10 in.; length, 136 ft. 3 in.; height, 38 ft. 5 in.; wing area, 2,433 sq. ft.

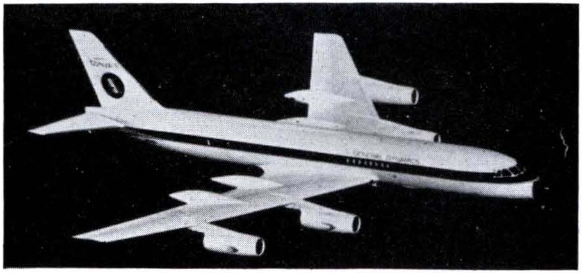




CONVAIR CV-880 MODEL 22

The CV-880 flew for the first time on January 27, 1959, and began commercial services with Delta Air Lines on May 15, 1960. The Model 22-M differs from the basic Model 22 in having 11,650 lb.s.t. CJ-805-3B engines, a power-boosted rudder and four leading-edge slats, maximum weight being 191,000 lb.

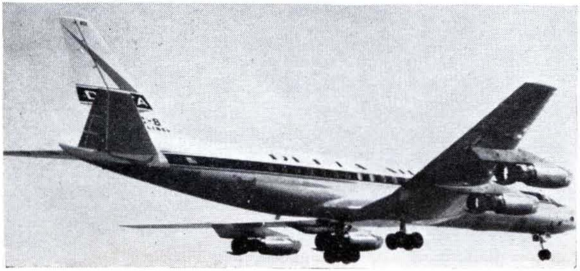
Nationality: American. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 11,200 lb.s.t. General Electric CJ-805-3 turbojets. **Accommodation:** 84–110 passengers. **Weights:** Empty, 81,800 lb.; basic, 89,000 lb.; max. loaded, 189,500 lb. **Performance:** Max. cruising, 615 m.p.h. (Mach 0·89); initial climb (max. loaded), 3,500 ft./min.; range (23,150 lb. payload), 3,200 mls. at 35,000 ft. **Dimensions:** Span, 120 ft.; length, 129 ft. 4 in.; height, 36 ft. 4 in.; wing area, 2,000 sq. ft.



CONVAIR CV-990 (CORONADO)

Originally known as the CV-600, the CV-990 is being produced in two versions. The basic CV-990 is intended for continental use, and the intercontinental version, which is known as the Coronado, has increased fuel and a maximum loaded weight of 244,200 lb. The CV-990 first flew on January 24, 1961.

Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 16,100 lb.s.t. General Electric CJ-805-23 turbofans. **Accommodation:** 96–121 passengers. **Weights:** Empty, 113,300 lb.; basic, 115,275 lb.; max., 239,200 lb. **Performance:** Max. cruising, 640 m.p.h. at 21,500 ft.; range (25,120-lb. payload), 4,300 mls. at 570 m.p.h. at 35,000 ft.; max. range, 5,527 mls. at 543 m.p.h. **Dimensions:** Span, 120 ft.; length, 139 ft. 5 in.; height, 39 ft. 6 in.; wing area, 2,250 sq. ft.



DOUGLAS DC-8 SERIES 10

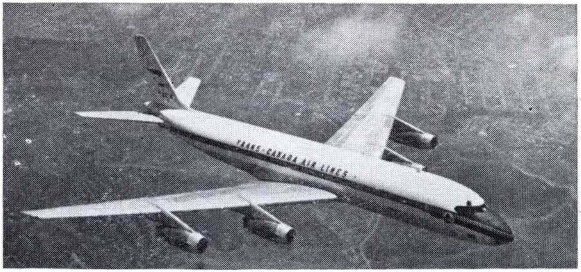
The first domestic version of the DC-8, the Series 10, is in service with Delta Air Lines and United Air Lines, the first aircraft of this type flying on May 30, 1958. The Series 20 is similar but has 15,800 lb.s.t. Pratt and Whitney JT4A-3 engines. The Series 20 flies with United, Eastern and National.

Nationality: American. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 13,500 lb.s.t. Pratt and Whitney JT3C-6 turbojets. **Accommodation:** 112–173 passengers. **Weights:** Empty (operating), 120,999 lb.; capacity payload, 34,030 lb.; max. loaded, 273,000 lb. **Performance:** Cruising (at 220,000 lb.), 555 m.p.h. at 30,000 ft.; initial climb, 1,330 ft./min.; max. range, 4,120 mls. **Dimensions:** Span, 142 ft. 5 in.; length, 150 ft. 6 in.; height, 42 ft. 4 in.; wing area, 2,771 sq. ft.

DOUGLAS DC-8 SERIES 40

The Series 40 was the second long-range intercontinental version of the DC-8, the first being the Series 30 with 17,500 lb.s.t. JT4A-11 turbojets. Some Series 30 DC-8s are being converted to Series 50 standards by the installation of 17,000 lb.s.t. JT3D-1 or 18,000 lb. JT3D-3 turbofans.

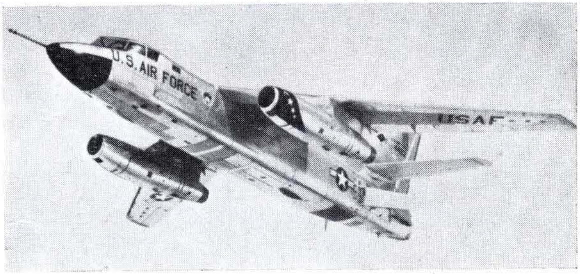
Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 17,500 lb.s.t. Rolls-Royce Conway R.Co.12 turbojets. **Accommodation:** 116–176 passengers. **Weights:** Empty (operating) 124,369 lb.; max. loaded, 310,000 lb. **Performance:** Max. cruising (at 220,000 lb.), 593 m.p.h. at 30,000 ft.; range (with 28,336-lb. payload), 6,820 mls. at 551 m.p.h. at 36,000 ft. **Dimensions:** Span, 142 ft. 5 in.; length, 150 ft. 6 in.; height, 42 ft. 4 in.; wing area, 2,771 sq. ft.



DOUGLAS RB-66B DESTROYER

The majority of the 209 Destroyers built for the U.S.A.F. when production terminated in June 1958 were of the B-66B bomber and RB-66B night photo-reconnaissance aircraft. Fifty-five RB-66C all-weather electronics reconnaissance and WB-66D weather reconnaissance aircraft were completed.

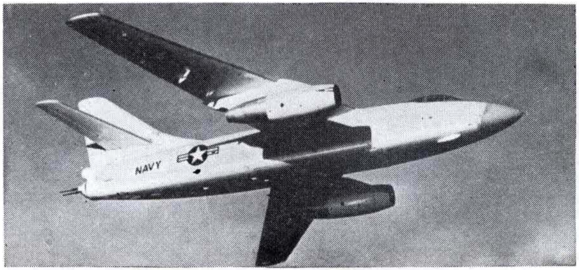
Nationality: American. **Type:** Three-seat Night Photo-reconnaissance Aircraft. **Power Plants:** Two 10,200 lb.s.t. Allison J71-A-13 turbojets. **Armament:** Two 20-mm. cannon. **Weights:** Empty, 39,686 lb.; loaded, 70,000 lb.; max., 79,000 lb. **Performance:** Max. speed, 620 m.p.h. at 10,000 ft. (Mach 0·85), 594 m.p.h. at 36,000 ft.; range, 1,500–1,700 mls.; service ceiling, 48,000 ft. **Dimensions:** Span, 72 ft. 6 in.; length, 75 ft. $1\frac{1}{4}$ in.; height, 23 ft. 7 in.; wing area, 779 sq. ft.

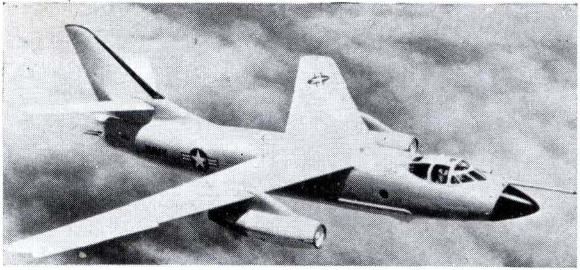


DOUGLAS A3D-2 SKYWARRIOR

One heavy attack squadron of A3D-2 Skywarriors is based aboard each of the U.S. Navy's principal carriers. Carrying three crew members, the A3D-2 entered service early in 1957 and is capable of L.A.B.S. bombing with automatic, semi-automatic or manual techniques. The A3D-2 can be adapted as a refuelling tanker.

Nationality: American. **Type:** Shipboard Attack Bomber. **Power Plants:** Two 10,500 lb.s.t. (12,400 lb. wet) Pratt and Whitney J57-P-10 turbojets. **Armament:** Two 20-mm. cannon and 12,000-lb. bomb load. **Weights:** Empty, 38,298 lb.; normal, 73,000 lb.; max., 84,000 lb. **Performance:** Max. speed, 610 m.p.h. at 10,000 ft. (Mach 0·83); radius (standard tankage), 1,050 mls.; service ceiling, 41,000 ft. **Dimensions:** Span, 72 ft. 6 in.; length, 76 ft. 4 in.; height, 22 ft. $9\frac{1}{2}$ in.; wing area, 780 sq. ft.

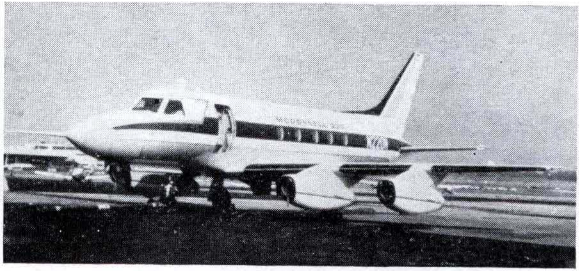




DOUGLAS A3D-2P SKYWARRIOR

The A3D-2P photo-reconnaissance aircraft is one of three specialised versions of the Skywarrior, the others being the A3D-2Q electronics countermeasures and reconnaissance model carrying a crew of seven in a redesigned, fully pressurised fuselage, and the A3D-2T trainer accommodating pilot, instructor and six pupils. The A3D-2P, which first flew on July 22, 1958, has twelve cameras and a shorter bomb-bay for photo-flash bombs.

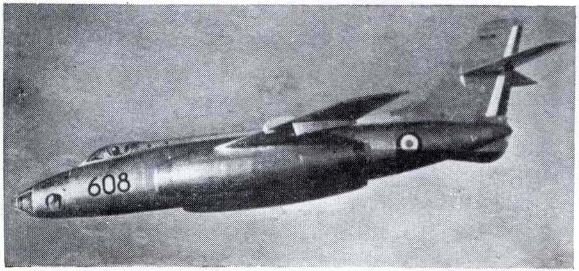
Nationality: American. **Type:** Three-seat Shipboard Photo-reconnaissance Aircraft. **Power Plants:** Two 10,500 lb.s.t. (12,400 lb. wet) Pratt and Whitney J57-P-10 turbojets. **Armament:** Two 20-mm. cannon. **Weight:** Max. loaded, 73,000 lb. **Performance:** As for A3D-2. **Dimensions:** Span, 72 ft. 6 in.; length, 74 ft. 4 in.; height, 22 ft. 9½ in.; wing area, 780 sq. ft.



MCDONNELL MODEL 220

The commercial executive transport counterpart of the military Model 119 which competed unsuccessfully for the U.S.A.F.'s UCX requirement, the Model 220 prototype is powered by four Westinghouse J34 turbojets derated to approx. 3,000 lb.s.t. each, but CJ-700 turbofans or JT12s are proposed, and the following relates to the JT12-powered model 220.

Nationality: American. **Type:** Commercial Executive Transport. **Power Plants:** Four 3,000 lb.s.t. Pratt and Whitney JT12A-3 turbojets. **Accommodation:** Ten passengers. **Weights:** Loaded, 40,928 lb.; max., 45,238 lb. **Performance:** Max. cruising, 565 m.p.h. at 36,000 ft. (Mach 0·856); econ. cruising, 521 m.p.h.; range, 2,341 mls. **Dimensions:** Span, 57 ft. 7¼ in.; length, 66 ft. 5⅞ in.; height, 23 ft. 7¾ in.; wing area, 550 sq. ft.



SUD-AVIATION SO-4050 VAUTOUR IIB

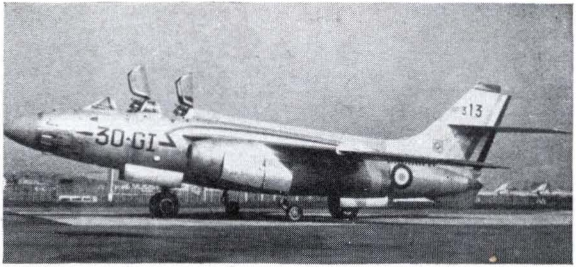
Serving with the 92e Escadre of the Armée de l'Air, the Vautour IIB two-seat light bomber flew for the first time on July 31, 1957, forty being built. A single-seat fighter-bomber version, the IIA (see page 36), serves with the Israel air arm. Thirty IIAs were built.

Nationality: French. **Type:** Two-seat Light Tactical Bomber. **Power Plants:** Two 7,720 lb.s.t. S.N.E.C.M.A. Atar 101E-3 turbojets. **Armament:** Four 500-lb., 750-lb. or 1,000-lb. bombs externally and up to 6,000-lb. internally. **Weights:** Empty, 23,150 lb.; loaded, 30,865 lb.; max., 39,684 lb. **Performance:** Max. speed, 720 m.p.h. at sea level (Mach 0·947); initial climb (at 30,865 lb.), 13,880 ft./min.; tactical radius, 750 mls. **Dimensions:** Span, 49 ft. 6½ in.; length, 51 ft. 1 in.; height, 14 ft. 1¾ in.; wing area, 484·376 sq. ft.

SUD-AVIATION SO-4050 VAUTOUR IIN

The Vautour IIN is the night fighting variant of the basic SO-4050 design, serving with the 30th Escadre of France's Défense Aérienne. The Vautour IIN can carry two Matra 104A packs containing a total of 232 68-mm. rockets internally, in addition to cannon. Seventy Vautour IINs were built.

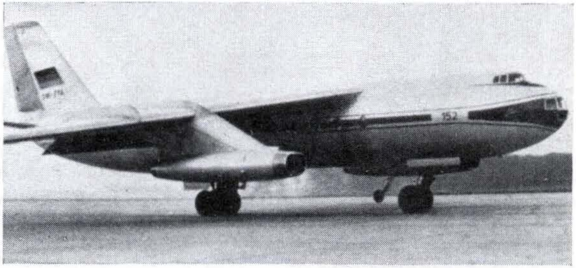
Nationality: French. **Type:** Two-seat Night and All-weather Interceptor. **Power Plants:** Two 7,720 lb.s.t. S.N.E.C.M.A. Atar 101E-3 turbojets. **Armament:** Four 30-mm. cannon and rockets. **Weights:** Empty, 23,150 lb.; loaded, 33,069 lb.; max., 45,635 lb. **Performance:** Max. speed, 686 m.p.h. at sea level (Mach 0·9), 590 m.p.h. at 40,000 ft.; initial climb, 11,820 ft./min.; service ceiling, 50,000 ft. **Dimensions:** Span, 49 ft. 6½ in.; length, 51 ft. 1 in.; height, 14 ft. 1¾ in.; wing area, 484·376 sq. ft.



VEB-152-II

Developed by the Flugzeugwerke Dresden, the VEB-152 has suffered numerous teething troubles since it flew on December 4, 1958. The VEB-152-I (illustrated) is the pre-production model with tandem main undercarriage members, but the VEB-152-II described by the specification has an orthodox nosewheel.

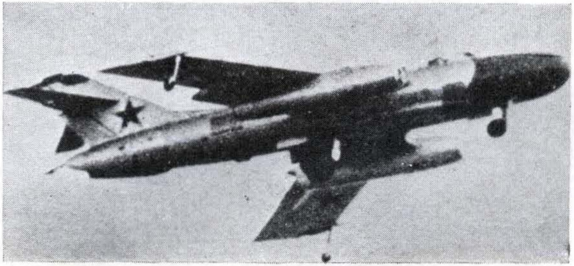
Nationality: East German. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 7,270 lb.s.t. Pirna 014A-1 turbojets. **Accommodation:** 48–72 passengers. **Weights:** Empty, 62,060–62,660 lb.; max., 102,530 lb. **Performance:** Max. speed, 571 m.p.h. at 15,400 ft.; cruising, 497 m.p.h. at 30,200–35,400 ft.; initial climb (max. loaded), 4,330 ft./min.; range (57–72 passengers), 1,242 mls. **Dimensions:** Span, 86 ft. 7¼ in.; length, 107 ft.; height, 29 ft. 6 in.; wing area, 1,485 sq. ft.

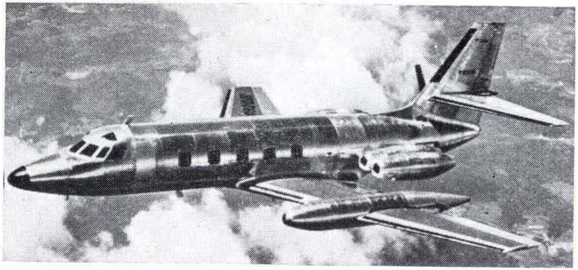


YAKOVLEV YAK-25 (FLASHLIGHT-A)

Standard Soviet night and all-weather interceptor since 1955, the Yak-25 carries PD-6 interception radar in large nose radome, and features tandem main undercarriage members. Two developments, the Flashlight-B and -C, as described on page 83.

Nationality: Russian. **Type:** Two-seat Night and All-weather Interceptor. **Power Plants:** Two 7,935 lb.s.t. Kuznetsov turbojets. **Armament:** Two 37-mm. cannon and seventy-six 55-mm. rockets or four ChM missiles. **Weights:** Empty, 21,715 lb.; max., 35,270 lb. **Performance:** Max. speed, 705 m.p.h. at sea level; max. cruising, 600 m.p.h. at 23,000 ft.; range (max. fuel), 1,864 mls.; service ceiling, 50,800 ft. **Dimensions:** Span, 40 ft. 6 in.; length, 54 ft. 7½ in.; height, 15 ft. 6 in.; wing area, 399·5 sq. ft.

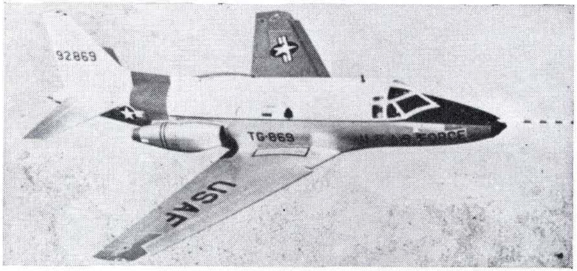




LOCKHEED (C-140) JETSTAR

Originally designed to meet a military requirement, the JetStar is now being produced for both civil and military rôles. Eleven have been ordered by the U.S.A.F. as the C-140 for a M.A.T.S. special air mission wing and for the Airways and Air Communications Service, and two are to be delivered to the U.S. Navy. As an executive transport, ten passengers are carried.

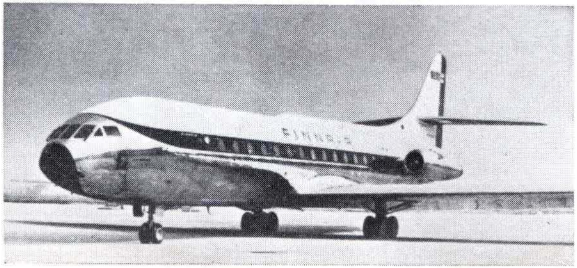
Nationality: American. **Type:** Utility Transport. **Power Plants:** Four 3,000 lb.s.t. Pratt and Whitney JT12A-6 turbojets. **Weights:** Empty, 18,450 lb.; loaded, 30,680 lb.; max., 38,940 lb. **Performance:** Max. speed, 573 m.p.h.; max. cruising, 540 m.p.h. at 20,000 ft.; initial climb, 4,800 ft./min.; service ceiling, 45,000 ft.; normal range, 2,228 mls. **Dimensions:** Span, 53 ft. 8 in.; length, 60 ft. 5½ in.; height, 20 ft. 6 in.; wing area, 543 sq. ft.



NORTH AMERICAN T-39 SABRELINER

Designed and built to meet the requirements of the U.S.A.F.'s UTX specification, the T-39 is currently being delivered in two versions: the T-39A utility trainer, and the T-39B specially equipped with NASARR, an all-weather search and range radar. Ninety-four T-39s have been ordered, including six T-39Bs, and deliveries began in January 1961.

Nationality: American. **Type:** Utility Trainer. **Power Plants:** Two 3,000 lb.s.t. Pratt and Whitney J60-P-3 (JT12A-6) turbojets. **Weights:** Empty, 9,199 lb.; loaded, 15,330 lb.; max., 17,760 lb. **Performance:** Max. speed, 595 m.p.h. at 36,000 ft. (Mach 0·9); max. cruising, 502 m.p.h. at 43,500 ft.; econ., 475 m.p.h.; initial climb, 5,550 ft./min. **Dimensions:** Span. 44 ft. 4¾ in.; length, 43 ft. 8⅜ in.; length, 15 ft. 10 ⅞in.; wing area, 342·5 sq.ft.



SUD-AVIATION SE-210 CARAVELLE III

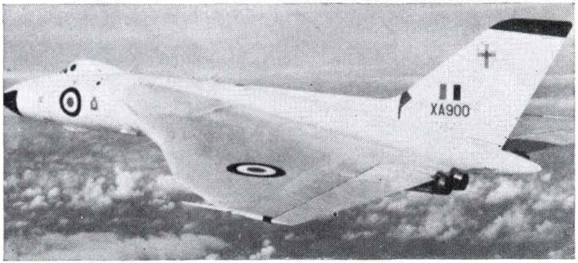
Several versions of the Caravelle have now been produced, including thirty-five examples of the Caravelle I with 10,500 lb.s.t. Avon 522s. The Caravelle III differs only in having uprated engines, and the still more powerful (12,500 lb.s.t.) Avon 531s of the Caravelle VI permit a take-off weight of 103,620 lb. The Caravelle VI-R has thrust reversers, and the VII and VIII have 16,100 lb.s.t. CJ805-23s and 14,340 lb.s.t. RB.141/3s respectively.

Nationality: French. **Type:** Short/medium-range Commercial Transport. **Power Plants:** Two 11,700 lb.s.t. Rolls-Royce Avon 527 turbojets. **Accommodation:** 80 passengers. **Weight:** Max. 99,208 lb. **Performance:** Max. cruising, 500 m.p.h. at 32,800 ft. **Dimensions:** Span, 112 ft. 6½in.; length, 105 ft.; height, 28 ft. 7⅓ in.; wing area, 1,579 sq. ft.

AVRO VULCAN B.1

The planned re-equipment of R.A.F. Bomber Command units with the Vulcan B.1 was completed by the beginning of 1960, and this type serves with Nos. 44, 101 and 617 Squadrons, and No. 230 Operational Conversion Unit. In production, the Vulcan B.1 was fitted with progressively more powerful Olympus engines, including the 11,000 lb. Mk. 101 and 12,000 lb. Mk. 102.

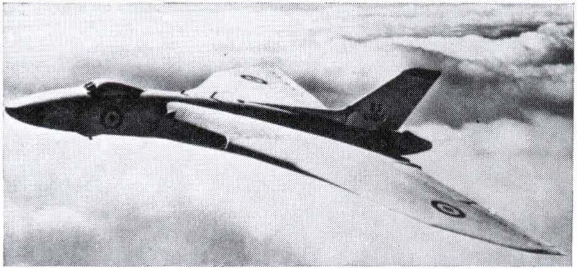
Nationality: British. **Type:** Long-range Medium Bomber. **Power Plants:** Four 13,000 lb.s.t. Bristol Siddeley Olympus 104 turbojets. **Weights:** Est. normal loaded, 160,000 lb.; est. max., 180,000–200,000 lb. **Performance:** Approx. max. speed, 625 m.p.h. at 40,000 ft. (Mach 0·95); range (standard tankage), 2,500–3,000 mls.; service ceiling, 50,000 + ft. **Dimensions:** Span, 99 ft.; length, 97 ft. 1 in.; height, 26 ft. 6 in.; wing area, 3,554 sq. ft.



AVRO VULCAN B.2

Current production version of the Vulcan, the B.2 represents a major redesign over the B.1. The first squadron delivery (No. 83) was made on July 1, 1960. The Vulcan is currently being developed to carry the Skybolt air-launched ballistic missile, this version being unofficially reported to have a modified wing and more powerful Olympus turbojets.

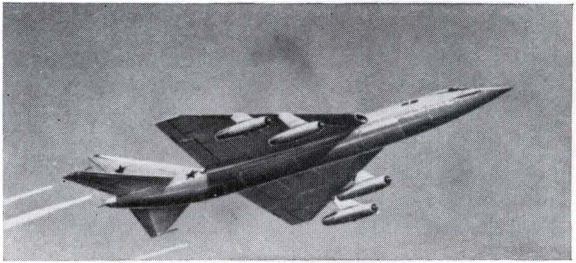
Nationality: British. **Type:** Long-range Medium Bomber. **Power Plants:** Four 17,000 lb.s.t. Bristol Siddeley Olympus 201 turbojets. **Armament:** One Blue Steel Mk. 1 missile or various loads of nuclear or conventional weapons. **Weight:** Est. max. loaded, 180,000–200,000 lb. **Performance:** Approx. max. speed, 625 m.p.h. at 40,000 ft. (Mach 0·95). **Dimensions:** Span, 111 ft.; length, 99 ft. 1 in.; height, 27 ft. 2 in.; wing area, 3,964 sq. ft.

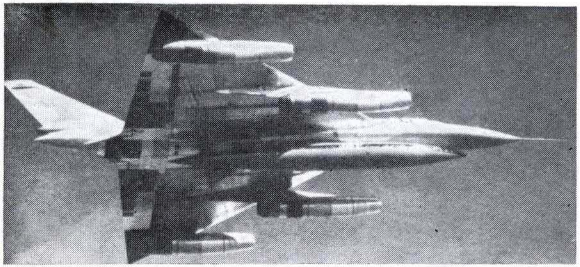


BOUNDER

Evidently designed to succeed the Tu-16, the Bounder is known to exist in at least six versions but its design origin is uncertain. One version of the Bounder carries twenty 60-mile range air-to-surface missiles, and the undercarriage comprises tandem four-wheel bogies with small outboard stabilising wheels. It is possible that the so-called " 201M " may be the Bounder.

Nationality: Russian. **Type:** Long-range Medium Bomber. **Power Plants:** Four 26,500 lb. (afterburning) turbojets. **Armament:** (Defensive) One fixed 23-mm. cannon and two 23-mm. cannon in tail barbette. **Weight:** Loaded, 251,000 lb. **Performance:** Max. speed, 1,320 m.p.h. at 59,000 ft. (Mach 2·0); normal range, 1,650 mls. **Dimensions:** Span, 60 ft.; length, 160 ft.; wing area, 2,410 sq. ft.

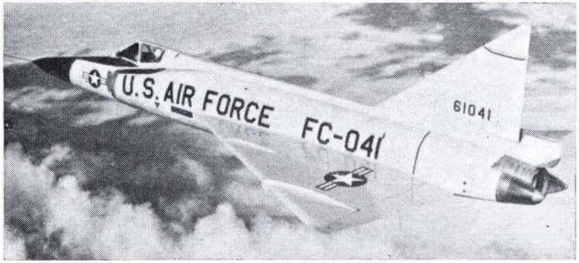




CONVAIR B-58A HUSTLER

Two wings of the U.S.A.F. Strategic Air Command are currently operating the B-58A, the first tactically operational example of which was completed in September 1959. Four pre-production Hustlers have been converted to TB-58 conversion trainers, the first of these having flown on May 10, 1960.

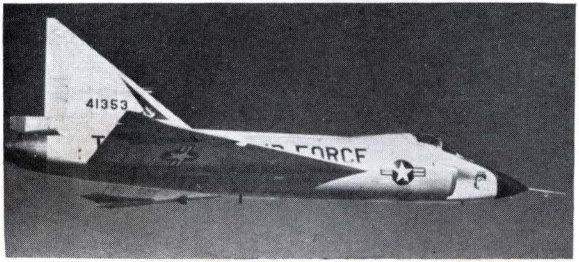
Nationality: American. **Type:** Long-range Medium Bomber. **Power Plants:** Four 10,000 lb.s.t. (15,600 lb. with afterburning) General Electric J79-GE-5B turbojets. **Armament:** One 20-mm. rotary cannon and detachable "mission pod". **Weight:** Loaded, 160,000 lb. **Performance:** Max. speed, 1,385 m.p.h. at 40,000 ft. (Mach 2·1); cruising, 595 m.p.h. at 40,000 ft. (Mach 0·9); ceiling, 60,000 ft. **Dimensions:** Span, 56 ft. 10 in.; length, 96 ft. 9 in.; height, 31 ft. 5 in.; wing area, 1,542 sq. ft.



CONVAIR F-102A DELTA DAGGER

Serving with the U.S.A.F. in Germany and Japan, and equipping seven Air National Guard squadrons, the F-102A was delivered to U.S.A.F. squadrons in mid-1956, and production was terminated in April 1958 after the completion of 875. The F-102A has now been fitted with a time division data link system.

Nationality: American. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 11,700 lb.s.t. (17,200 lb. with afterburning) Pratt and Whitney J57-P-23 turbojet. **Armament:** Six Falcons and twenty-four 2·75-in. rockets. **Weights:** Normal loaded, 28,600 lb.; max., 32,000 lb. **Performance:** Max. speed, 825 m.p.h. at 36,000 ft. (Mach 1·25); initial climb, 13,000 ft./min.; service ceiling, 54,000 ft. **Dimensions:** Span, 38 ft. 1½ in.; length, 68 ft. 4⅔ in.; height, 21 ft. 2½ in.; wing area, 661·5 sq. ft.



CONVAIR TF-102A

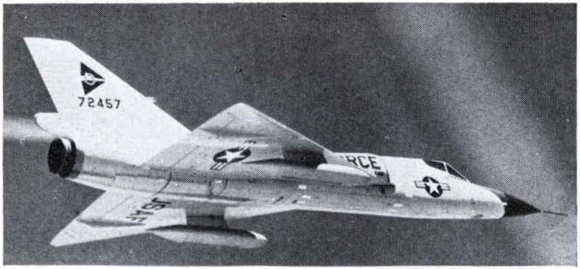
The TF-102A is a side-by-side two-seat combat readiness trainer version of the F-102A, but it may be used as a tactical interceptor and possesses the same weapons ability as the single-seater, although the Hughes MG-10 fire-control system is not carried. The first TF-102A flew on November 8, 1955, and sixty-three production machines were delivered to the U.S.A.F.

Nationality: American. **Type:** Two-seat Combat Proficiency Trainer. **Power Plant:** One 11,700 lb.s.t. (17,200 lb. with afterburning) Pratt and Whitney J57-P-23 turbojet. **Weight:** Normal loaded, 27,778 lb. **Performance:** Max. speed, 646 m.p.h. at 38,000 ft. (Mach 0·97); time to 32,800 ft., 2 min. 50 sec.; ceiling, 50,000 ft. **Dimensions:** Span, 38 ft. 1½ in.; length, 63 ft. 4½ in.; height, 20 ft. 7 in.; wing area, 661·5 sq. ft.

CONVAIR F-106A DELTA DART

One of the principal interceptors of the U.S.A.F. Air Defence Command, the F-106A first flew on December 26, 1956, and began to enter service in July 1959. The essentially similar tandem two-seat F-106B is also in service, most A.D.C. squadrons having nineteen single-seat F-106As and six two-seat F-106Bs.

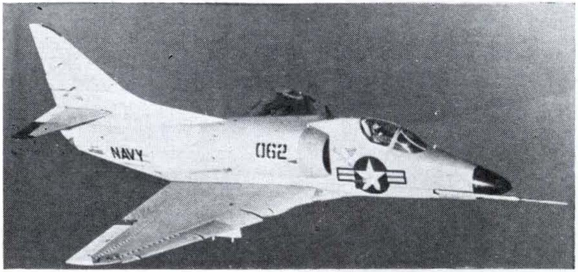
Nationality: American. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 17,200 lb.s.t. (24,500 lb. with afterburning) Pratt and Whitney J75-P-17 turbojet. **Armament:** Four Super Falcons and one Genie. **Weights:** Approx. empty, 26,000 lb.; loaded, 35,000 lb. **Performance:** Max. speed, 1,525 m.p.h. at 40,000 ft. (Mach 2·31); radius (standard tankage), 575 mls.; service ceiling, 57,000 ft. **Dimensions:** Span, 38 ft. 1½ in.; length, 70 ft. 8¾ in.; height, 20 ft. 3⅓ in.; wing area, 661·5 sq. ft.



DOUGLAS A4D-2N SKYHAWK

The A4D-2N and A4D-5 are the current production versions of the Skyhawk which, designed to operate from all types of U.S. Navy carriers, first flew on June 22, 1954. The A4D-2N differs from the A4D-2 primarily in having limited all-weather radar, and the A4D-5 has an 8,500 lb.s.t. Pratt and Whitney J52 engine.

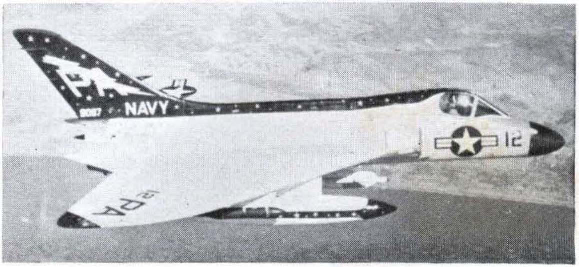
Nationality: American. **Type:** Single-seat Shipboard Attack Bomber. **Power Plant:** One 7,800 lb.s.t. Wright J65-W-16A turbojet. **Armament:** Two 20-mm. cannon and three Bullpups or up to 5,000 lb. of external ordnance. **Weights:** Empty, 9,559 lb.; normal loaded, 17,294 lb. **Performance:** Max. speed, 676 m.p.h. at sea level (Mach 0·88); normal combat radius, 460 mls.; max. range (max. external fuel), 1,150 mls. **Dimensions:** Span, 27 ft. 6 in.; length, 42 ft. 10¾ in.; height, 15 ft.; wing area, 260 sq. ft.

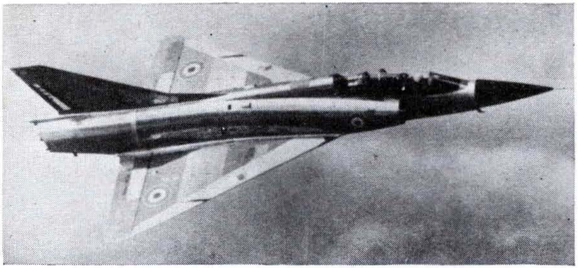


DOUGLAS F4D-1 SKYRAY

The only U.S. Navy fighter to participate in the Continental Air Defence System, the F4D-1 had a somewhat protracted development, three-and-a-half years elapsing between the first flight of the XF4D-1 on January 23, 1951, and that of the first production machine on June 5, 1954. Production terminated in 1958.

Nationality: American. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 10,500 lb.s.t. (14,500 lb. with afterburning) Pratt and Whitney J57-P-8. **Armament:** Four 20-mm. cannon and two Sidewinders plus thirty-eight 2·75-in. rockets. **Weights:** Loaded, 21,000 lb.; max., 25,000 lb. **Performance:** Max. speed, 720 m.p.h. at sea level (Mach 0·95), 695 m.p.h. at 36,000 ft. (Mach 1·05), initial climb, 18,000 ft./min. **Dimensions:** Span, 33 ft. 6 in.; length, 45 ft. 8¼ in.; height, 13 ft.

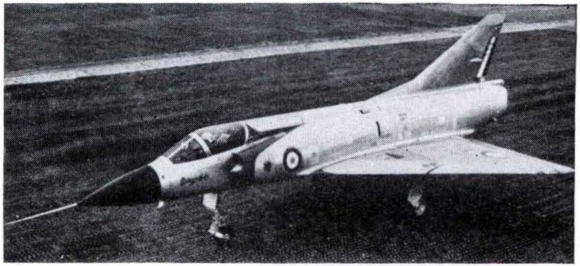




G.A.M. DASSAULT MIRAGE IIIB

Flown for the first time on October 20, 1959, the Mirage IIIB is a tandem two-seat version of the basic Mirage design evolved in parallel with the single-seat IIIC. Intended primarily for the familiarisation of pilots with all-weather interception at extreme altitudes, the IIIB is fractionally faster than the IIIC owing to its improved fineness ratio. Twenty-six IIIBs have been ordered.

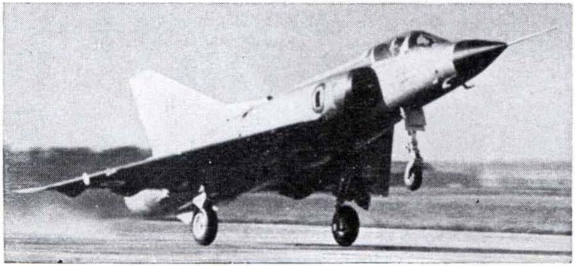
Nationality: French. **Type:** Two-seat Combat Proficiency Trainer. **Power Plant:** One 9,370 lb.s.t. (13,200 lb. with afterburning) S.N.E.C.M.A. Atar 9C and one 3,300 lb. S.E.P.R.841 rocket. **Armament:** Two 30-mm. cannon. **Weight:** Loaded, 17,460 lb. **Performance:** As for Mirage IIIC. **Dimensions:** Span, 27 ft.; length, 45 ft. 6 in.; height, 14 ft. 9 in.; wing area, 374 sq. ft.



G.A.M. DASSAULT MIRAGE IIIC

The first production Mirage IIIC flew on October 9, 1960, and an initial series of 100 is under construction for the Armée de l'Air. One hundred are on order for Switzerland and thirty for Australia. The IIID and IIIE are ground attack and reconnaissance versions.

Nationality: French. **Type:** Single-seat Interceptor. **Power Plant:** One 9,370 lb.s.t. (13,200 lb. with afterburning) S.N.E.C.M.A. Atar 9C plus S.E.P.R.841 rocket. **Armament:** Two 30-mm. cannon, two Sidewinders or one Nord 5103 or Matra 511. **Weights:** Empty, 13,530 lb.; loaded, 18,620–22,150 lb.; max., 27,760 lb. **Performance:** Max. speed, 1,353 m.p.h. at 36,000 ft. (Mach 2·05); climb to 30,000 ft., 3 min.; ceiling 82,000 ft. **Dimensions:** Span, 27 ft.; length, 43 ft. 10 in.; height, 14 ft. 9 in.; wing area, 374 sq. ft.



G.A.M. DASSAULT MIRAGE IIIO

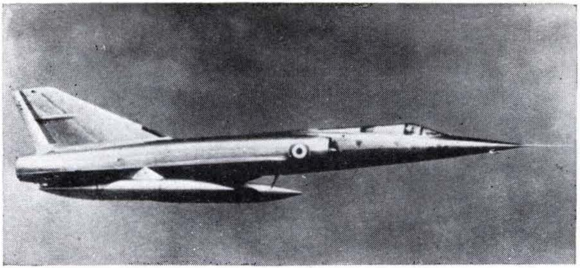
In connection with the Australian decision to purchase the Mirage interceptor, a Mirage III prototype has been fitted with an Avon 67 (RB.146) for comparative trials with the Atar-powered Mirage IIIC. Designated Mirage IIIO, the Avon-powered model flew for the first time on February 13, 1961.

Nationality: French. **Type:** Single-seat Interceptor. **Power Plant:** One 12,500 lb.s.t. (16,000 lb. with afterburning) Rolls-Royce Avon 67 turbojet. **Armament:** As Mirage IIIC. **Weights:** Empty, 14,230 lb.; loaded, 19,650 lb.; max., 28,460 lb. **Performance:** Max. speed, 1,386 m.p.h. at 36,000 ft. (Mach 2·1); low-altitude range, 495 mls.; high-altitude range, 990–1,130 mls.; ferry range, 2,300 mls. **Dimensions:** Span, 27 ft.; length, 43 ft. 10 in.; height, 14 ft. 9 in.; wing area, 374 sq. ft.

G.A.M. DASSAULT MIRAGE IV

Intended to provide France with a strategic striking force, the Mirage IVA is a scaled-up replica of the Mirage IIIC interceptor, and fifty are to be delivered to the Armée de l'Air, the first entering service in 1964. The production Mirage IVA will be scaled up some 12% over the prototype described by the specification, and Atar 9D engines will provide a speed of Mach 2·4–2·5.

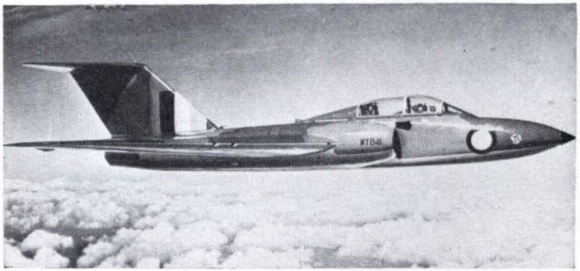
Nationality: French. **Type:** Two-seat Medium-range Light Bomber. **Power Plants:** Two 9,370 lb.s.t. (13,210 lb. with afterburning) S.N.E.C.M.A. Atar 9B turbojets. **Weight:** Loaded, 66,140 lb. **Performance:** Max. speed, 1,386 m.p.h. at 40,000–50,000 ft. (Mach 2·1), 817 m.p.h. at 10,000 ft. (Mach 1·3); max. range, 2,480 mls.; service ceiling, 59,000 ft. **Dimensions:** Span, 38 ft. 10⅛ in.; length, 76 ft. 11¼ in.; height, 18 ft. 6⅓ in.



GLOSTER JAVELIN T.3

A dual-control advanced trainer ordered for all-weather fighter conversion and derived from the initial production series of Javelin all-weather interceptors, the Javelin T.3 was the second production model to have an all-flying tail, being preceded by the Javelin F.A.W.4. Developed by Air Service Training, the Javelin T.3 first flew on August 20, 1956. It lacks the nose radar of the operational model.

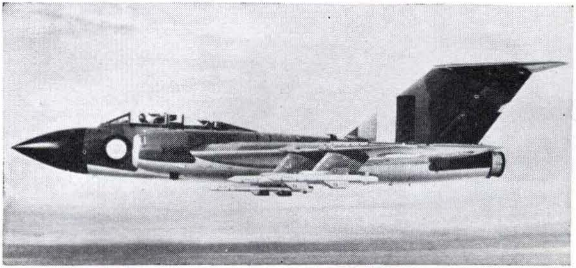
Nationality: British. **Type:** Two-seat Conversion Trainer **Power Plants:** Two 8,300 lb.s.t. Bristol Siddeley Sapphire 100 Srs. turbojets. **Weight:** Approx. loaded, 32,000 lb. **Performance:** Approx. max. speed, 595 m.p.h. at 40,000 ft. (Mach 0·9); service ceiling, 50,000+ ft. **Dimensions:** Span, 52 ft.; length, 61 ft.; height, 16 ft.; wing area, 928 sq. ft.

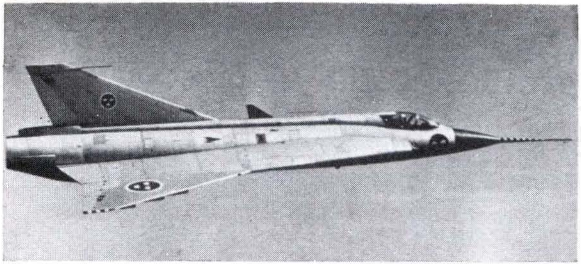


GLOSTER JAVELIN F.A.W.8

Production of the Javelin terminated in June 1960, but the F.A.W.8 and 9 versions are expected to remain in service with the R.A.F. for a considerable time. The F.A.W.8 was the final production model and has U.S. radar. The F.A.W.9 differs in having British radar and is essentially the F.A.W.7 brought up to F.A.W.8 standards, the conversions being completed by mid-1961.

Nationality: British. **Type:** Two-seat All-weather Interceptor. **Power Plants:** Two 11,000 lb.s.t. (12,300 lb. with afterburning) Bristol Siddeley Sapphire 203/204 turbojets. **Armament:** Two 30-mm. cannon and four Firestreaks. **Weight:** Approx. loaded, 38,000 lb. **Performance:** Est. max. speed, 695 m.p.h. at 10,000 ft. (Mach 0·95), 635 m.p.h. at 35,000 ft. **Dimensions:** Span, 52 ft.; length, 56 ft. 4 in.; height, 16 ft.; wing area, 928 sq. ft.

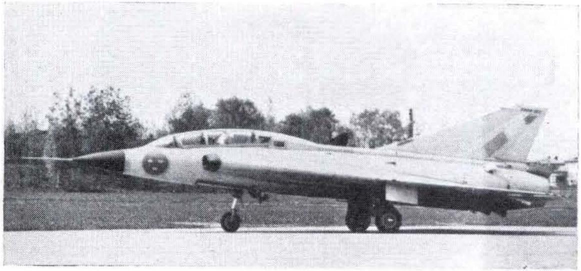




SAAB-35B DRAKEN

The current interceptor production version of the Draken, the SAAB-35B is a progressive development of the SAAB-35A which entered service with the Flygvapnet in 1960. Equipped with SAAB S7 collision-course fire-control equipment, the "B" differs from the "A" primarily in the type of engine installed.

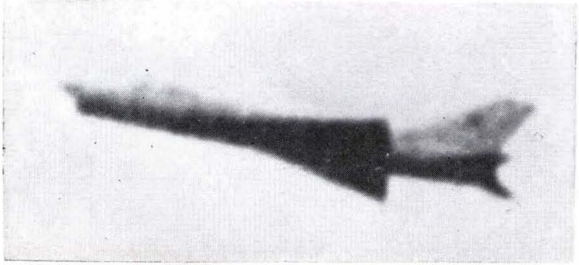
Nationality: Swedish. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 13,220 lb.s.t. (approx. 18,000 lb. with a/b) S.F.A. Rolls-Royce RB.146 Avon. **Armament:** Two 30-mm. cannon and two or four Sidewinders. **Weights:** Loaded (clean), 17,600 lb.; max., 19,800 lb. **Performance:** Est. max. speed, 1,450 m.p.h. at 40,000 ft. (Mach 2·2); max. climb rate, 50,000 ft./min.; service ceiling, 60,000 + ft. **Dimensions:** Span, 30 ft. 9⅞ in.; length, 51 ft. 10 in.; height, 12 ft. 10 in.; wing area, 538 sq. ft.



SAAB-35C DRAKEN

A tandem two-seat operational conversion training version of the original single-seat SAAB-35A, the SAAB-35C flew for the first time on December 30, 1959, and a small number have been built for the Flygvapnet's Operational Training Unit at Uppsala. Apart from the front fuselage, the SAAB-35C is identical to the SAAB-35A, and performance is similar.

Nationality: Swedish. **Type:** Two-seat Operational Conversion Trainer. **Power Plant:** One 11,250 lb.s.t. (15,600 lb. with afterburning) S.F.A. RM 6B turbojet. **Weight:** Loaded, 17,640–19,840 lb. **Performance:** Max. speed, 1,188 m.p.h. at 36,000 ft. (Mach 1·8); max. climb rate, 39,000 ft./min.; service ceiling, 60,000 + ft. **Dimensions:** Span, 30 ft. 9⅞ in.; length, 52 ft. 4 in.; height, 13 ft. 3 in.; wing area, 538 sq. ft.



SUKHOI FISHPOT

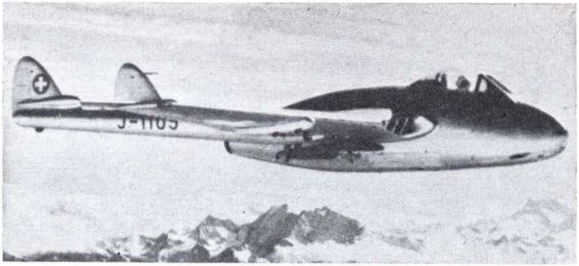
The Fishpot was one of two types of experimental fighter designed by Pavel Sukhoi's bureau to be demonstrated at Tushino in 1956. The second type, the Fishbed, appeared to employ an essentially similar wing to that of the Fishpot but is not believed to have attained service status. It is believed that the "E66" which established an altitude record of 112,205 ft. was the Fishpot.

Nationality: Russian. **Type:** Single-seat All-weather Interceptor. **Power Plant:** One 13,000 lb.s.t. (20,000 lb. with afterburning) turbojet. **Weights:** Est. loaded, 21,000 lb.; max., 24,000 lb. **Armament:** Four M-100A homing missiles and 50-mm. rockets. **Performance:** Approx. max. speed, 1,452 m.p.h. at 40,000 ft. (Mach 2·2). **Dimensions:** Span, 26 ft.; length, 50 ft.; wing area, 260 sq. ft.

DE HAVILLAND VAMPIRE F.B.6

Although the Vampire flew for the first time in September 1943, a considerable number are still flying. One hundred Vampire F.B.6s (illustrated) were built in Switzerland, and the F.B.9, which is similar apart from having cabin refrigeration, still serves in India where it was built under licence. The essentially similar F.B.52 serves in Jordan, Finland and Lebanon.

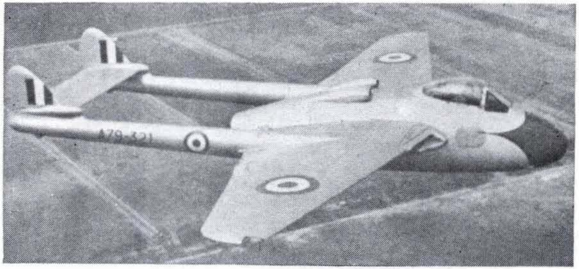
Nationality: British. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 3,350 lb.s.t. de Havilland Goblin D.Gn.3. **Armament:** Four 20-mm. cannon and 2,000-lb. bomb load. **Weights:** Empty, 7,283 lb.; loaded, 10,550 lb.; max., 12,390 lb. **Performance:** Max. speed, 548 m.p.h. at 30,000 ft.; initial climb, 4,800 ft./min.; range, 1,220 mls. **Dimensions:** Span, 38 ft.; length, 30 ft. 9 in.; height 8 ft. 10 in.; wing area, 262 sq. ft.



DE HAVILLAND VAMPIRE F.B.30

Now relegated largely to the training rôle, the Vampire F.B.30 was manufactured by de Havilland Aircraft Co. (Pty). Ltd. in Australia for the R.A.A.F., eighty aircraft of this type being built, the first flying on June 29, 1949. The Vampire F.B.30 was based on the British F.B.5 but the Nene turbojet provided some 40% more power and necessitated additional intakes.

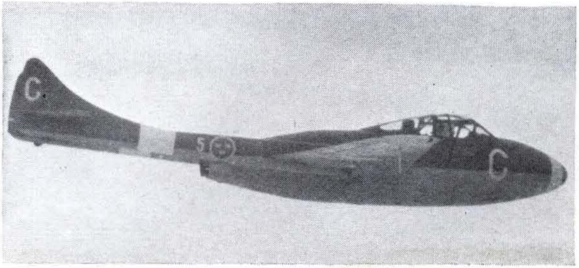
Nationality: Australian. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,000 lb.s.t. C.A.C.-built Rolls-Royce Nene 2-VH turbojet. **Armament:** Four 20-mm. cannon and 2,000-lb. bomb load. **Weights:** Empty, 7,600 lb.; loaded, 11,000 lb. **Performance:** Max. speed, 570 m.p.h. at sea level, 550 m.p.h. at 20,000 ft.; time to 40,000 ft., 10 min.; ceiling, 49,000 ft. **Dimensions:** As for Vampire F.B.6.

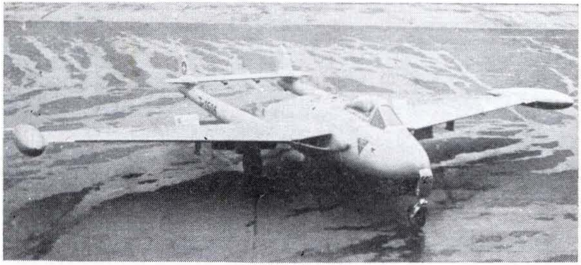


DE HAVILLAND VAMPIRE T.11

Side-by-side two-seat training variant of the single-seat Vampire fighter-bomber, the Vampire T.11 is used extensively by the R.A.F., and by the Fleet Air Arm as the Sea Vampire T.22. Australian-built versions include the R.A.A.F.'s Vampire T.33 and T.35, and the R.A.N.'s T.34, and the export version, the Vampire T.55 (illustrated) serves with some fourteen air arms.

Nationality: British. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 3,500 lb.s.t. de Havilland Goblin 35 turbojet. **Armament:** Two 20-mm. cannon. **Weights:** Empty, 7,380 lb.; loaded, 11,150 lb.; max., 12,920 lb. **Performance:** Max. speed, 538 m.p.h. at sea level, 549 m.p.h. at 20,000 ft.; initial climb, 4,500 ft./min.; range (clean), 853 mls. **Dimensions:** Span, 38 ft.; length, 34 ft. 5 in.; height, 6 ft. 2 in.; wing area, 262 sq. ft.

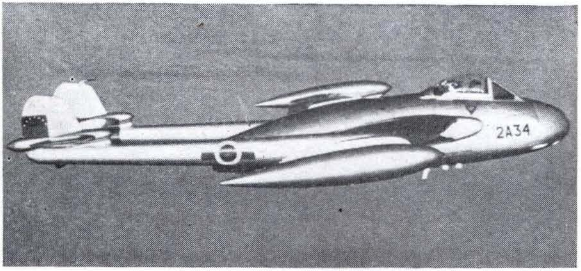




DE HAVILLAND VENOM F.B.50

The Venom F.B.50 is the designation applied to the Venom F.B.1 manufactured under licence in Switzerland and currently equipping a number of first-line Swiss Air Force elements. The first prototype Venom flew on September 2, 1949, and 250 Venom F.B.50s were built in Switzerland, commencing in 1951.

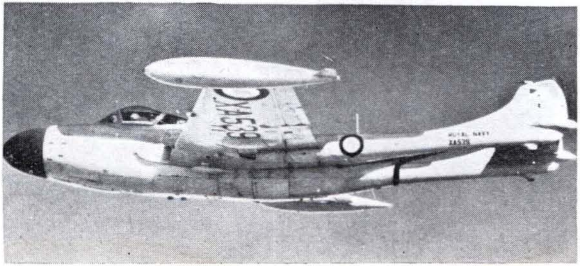
Nationality: British. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 4,850 lb.s.t. de Havilland Ghost 103 turbojet. **Armament:** Four 20-mm. cannon and 2,000-lb bomb load. **Weights:** Loaded (clean), 13,650 lb.; max., 15,700 lb. **Performance:** Max. speed, 582 m.p.h. at sea level, 566 m.p.h. at 20,000 ft.; initial climb, 6,200 ft./min.; endurance, 1 hr. 20 min. at sea level, 2 hr. 45 min. at 40,000 ft. **Dimensions:** Span, 41 ft. 8 in.; length, 33 ft.; height, 6 ft. 2 in.; wing area, 279·8 sq. ft.



DE HAVILLAND VENOM F.B.4

Currently being phased out of service in favour of the Hunter F.G.A.9 with units of the R.A.F.'s Far East Air Force, the Venom F.B.4 differs from the F.B.1/F.B.50 in having powered ailerons, revised tail surfaces and an uprated engine. Venom F.B.4s serve with the Venezuelan Air Force, one of these being illustrated.

Nationality: British. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,150 lb.s.t. de Havilland Ghost 105 turbojet. **Armament:** Four 20-mm. cannon and two 1,000-lb. bombs or eight 60-lb. rockets. **Weights:** Loaded, 11,500 lb.; max., 15,830 lb. **Performance:** Max. speed, 597 m.p.h. at sea level (Mach 0·785), 576 m.p.h. at 20,000 ft. (Mach 0·815), 531 m.p.h. at 45,000 ft. (Mach 0·805); initial climb, 7,230 ft./min. **Dimensions:** Span, 41 ft. 8 in.; length, 33 ft.; height, 6 ft. 8 in.; wing area, 279·8 sq. ft.



DE HAVILLAND SEA VENOM F.A.W.53

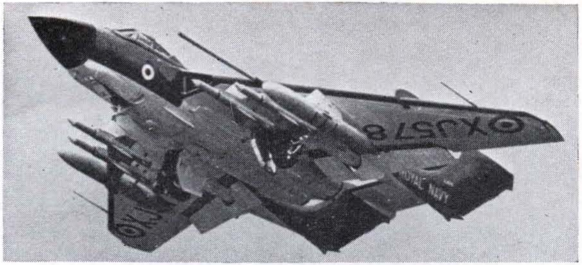
A shipboard version of the land-based two-seat Venom night fighter, the Sea Venom F.A.W.53 is an export version of the Royal Navy's F.A.W.21 for the Australian Navy, currently serving with No. 808 Squadron aboard H.M.A.S. *Melbourne*. The F.A.W.22, now withdrawn from first-line Fleet Air Arm service, differs primarily in having the 5,150 lb.s.t. Ghost 105.

Nationality: British. **Type:** Two-seat Shipboard All-weather Fighter. **Power Plant:** One 4,850 lb.s.t. de Havilland Ghost 104 turbojet. **Armament:** Four 20-mm. cannon. **Weight:** Max. loaded, 15,900 lb. **Performance:** Max. speed, 563 m.p.h. at sea level, 545 m.p.h. at 30,000 ft.; initial climb, 4,850 ft./min.; service ceiling, 37,000 ft. **Dimensions:** Span, 42 ft. 10 in.; length, 36 ft. 8 in.; height, 8 ft. 6 in.; wing area, 279 sq. ft.

DE HAVILLAND SEA VIXEN F.A.W.1

Originally ordered in quantity for the Fleet Air Arm in January 1955, the Sea Vixen entered service with No. 892 Squadron in July 1959, and among other units operating this type are Nos. 766, 890, 891 and 893 Squadrons. Current orders for the Sea Vixen are sufficient to maintain production throughout 1961.

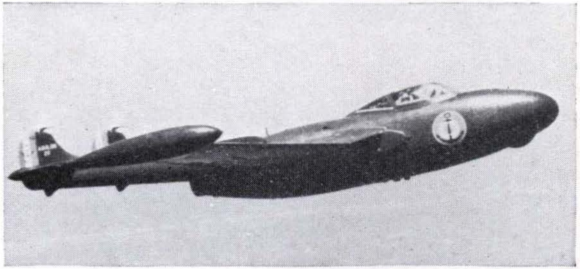
Nationality: British. **Type:** Two-seat Shipboard All-weather Strike Fighter. **Power Plants:** Two 10,000 lb.s.t. Rolls-Royce Avon 208 turbojets. **Armament:** Four Firestreaks and twenty-eight 2-in. rockets. **Weight:** Approx. loaded, 35,000 lb. **Performance:** Est. max. speed, 690 m.p.h. at 10,000 ft. (Mach 0·95); initial climb, 10,000+ ft./min.; time to 40,000 ft., 7–8 min.; service ceiling, 50,000+ ft. **Dimensions:** Span, 50 ft.; length, 55 ft. 7 in.; height, 10 ft. 9 in.; wing area, 648 sq. ft.



SUD-EST AQUILON 202

Equipping the two all-weather shipboard fighter squadrons (11F and 16F) of the Aéronavale, the Aquilon 202 was the principal French licence-built version of the Sea Venom F.A.W.20. The Aquilon 202 differs from the original Aquilon 20 in having ejector seats, and the Aquilons 203 and 204 are respectively single-seater and training versions.

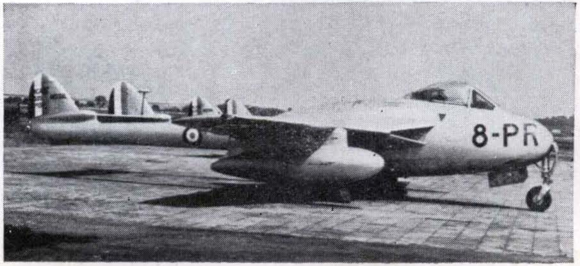
Nationality: French. **Type:** Two-seat Shipboard All-weather Fighter. **Power Plant:** One 4,850 lb.s.t. Fiat-built de Havilland Ghost 48 turbojet. **Armament:** Four 20-mm. cannon and two Matra 5103 missiles. **Weights:** Empty, 10,769 lb.; loaded, 16,755 lb. **Performance:** Max. speed, 581 m.p.h. at 9,842 ft.; range, 965 mls. **Dimensions:** Span, 42 ft. 10½ in.; length, 36 ft. 6 in.; height, 7 ft. 7 in.; wing area, 279·8 sq. ft.

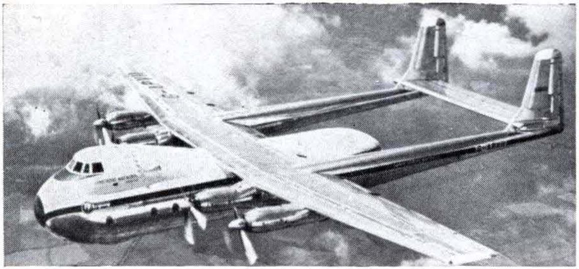


SUD-EST MISTRAL 535

A development of the de Havilland Vampire built under licence in France, the Mistral flew for the first time on April 2, 1951, and 247 machines were delivered to the Armée de l'Air, production being completed on March 25, 1954. It differs from the Vampire extensively structurally, and has larger intakes for its engine and an ejector seat. It serves with the 6th and 7th Escadres.

Nationality: French. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 5,000 lb.s.t. Hispano-Suiza Nene 104. **Armament:** Four 20-mm. cannon and 2,000 lb. bombs. **Weights:** Empty, 7,672 lb.; loaded, 10,933 lb.; max., 12,654 lb. **Performance:** Max. speed, 575 m.p.h. at sea level, 557 m.p.h. at 19,685 ft.; initial climb, 7,087 ft./min.; ceiling, 49,210 ft. **Dimensions:** Span, 38 ft.; length, 30 ft. 9 in.; height, 6 ft. 2 in.; wing area, 262 sq. ft.

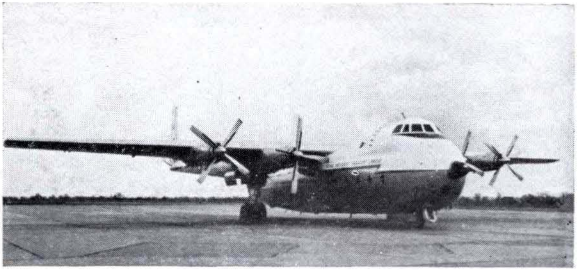




ARMSTRONG WHITWORTH A.W.650 ARGOSY

Designed specifically to meet requirements for a large-capacity commercial freighter, the A.W.650 Argosy has, in fact, been evolved from a military specification formulated in 1955. The first of ten pre-production A.W.650s was flown on January 8, 1959, seven have been delivered to Riddle and three to B.E.A.

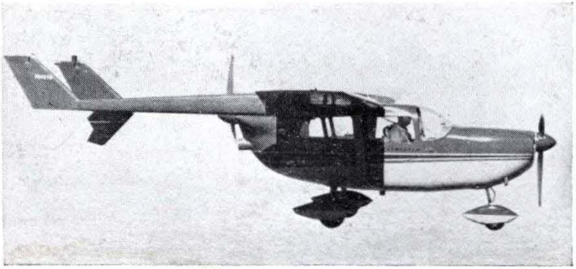
Nationality: British. **Type:** Short- and Medium-range Commercial Freighter. **Power Plants:** Four 2,105 e.h.p. Rolls-Royce Dart 526 turboprops. **Weights:** Empty, 46,420 lb.; basic operating, 48,000–53,400 lb.; max., 88,000 lb. **Performance:** Average cruising, 276–296 m.p.h.; range (20,000-lb. payload), 1,700 mls.; max. range (no reserves), 2,500 mls. **Dimensions:** Span, 115 ft.; length, 86 ft. 9 in.; height, 27 ft.; wing area, 1,458 sq. ft.



ARMSTRONG WHITWORTH A.W.660 ARGOSY C.1

Flown for the first time on March 6, 1961, the A.W.660 is a military version of the commercial A.W.650, and fifty-six have been ordered for R.A.F. Transport Command. Differing from the A.W.650 primarily in having clamshell rear-loading doors, it employs some 70% of the commercial freighter's structure.

Nationality: British. **Type:** Military Tactical Transport. **Power Plants:** Four 2,680 e.h.p. Rolls-Royce Dart 101 turboprops. **Weights:** Basic equipped, 56,000 lb.; loaded, 97,000 lb.; max., 103,000 lb. **Performance:** Average cruising (at 80,000 lb.), 269 m.p.h. at 20,000 ft.; range (with 29,000-lb. payload and 20% reserves), 576 mls. at 5,000 ft., (20,000-lb payload), 1,382 mls.; operational ceiling (at 90,000 lb.), 21,000 ft. **Dimensions:** Span, 115 ft.; length, 88 ft. 1 in.; height, 27 ft.; wing area, 1,458 sq. ft.



CESSNA 336 SKYMASTER

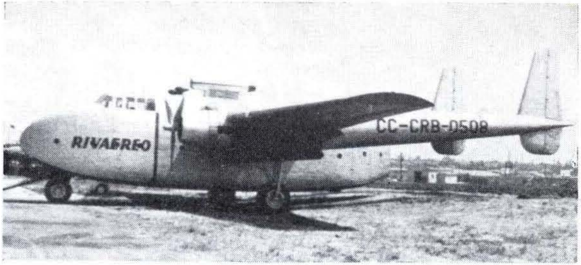
The Model 336 Skymaster, production deliveries of which are scheduled to commence in 1962, was flown for the first time in March 1961. Employing a radical configuration, the Skymaster has one Continental mounted in an orthodox nose installation and a second mounted aft of the cabin, driving a pusher airscrew between twin tailbooms. This arrangement was selected primarily for the increased safety it offers in single-engine operation. Few details of the Skymaster had been revealed at the time of closing for press.

Nationality: American. **Type:** Four-seat Commercial Utility Monoplane. **Power Plants:** Two 175 h.p. Continental GO-300-C engines. **Weights:** No details available. **Performance:** No details available. **Dimensions:** No details available.

FAIRCHILD C-82A PACKET

Two hundred and twenty C-82A Packet transports had been produced for the U.S.A.F. when production was terminated in favour of the C-119, and of the C-82As made surplus, a number serve with the Brazilian Air Force, and others are employed by civil operators. That illustrated is fitted with a small auxiliary turbojet for high altitude operation.

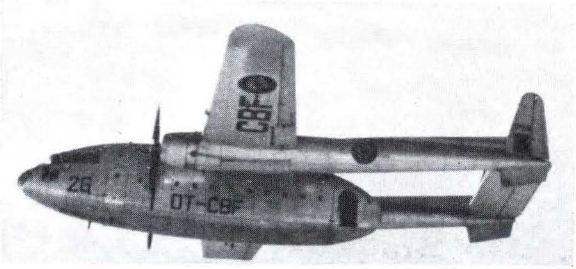
Nationality: American. **Type:** Medium-range Freighter. **Power Plants:** Two 2,100 h.p. Pratt and Whitney R-2800-85 engines. **Weights:** Empty, 31,288 lb.; loaded, 50,000 lb. **Performance:** Max. speed, 238 m.p.h. at 17,500 ft.; initial climb, 920 ft./min.; service ceiling, 22,000 ft.; range (with 13,000-lb. payload), 500 mls. **Dimensions:** Span, 106 ft. 6 in.; length, 77 ft. 1 in.; height 26 ft. 5 in.; wing area, 1,400 sq. ft.



FAIRCHILD C-119G

An improved version of the C-82A, the C-119 appeared late in 1947, and the last and 1,112th machine was delivered late in 1955. The final production model, the C-119G, serves with the U.S.A.F. the R.C.A.F., and the air forces of Belgium (illustrated), Nationalist China, Italy, India, and Norway.

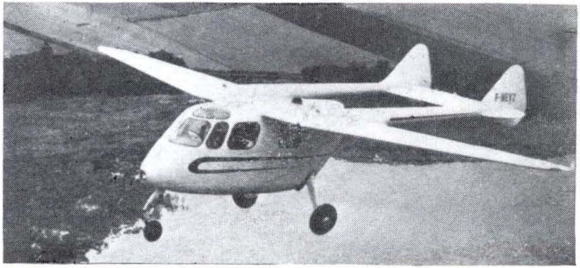
Nationality: American. **Type:** Short- and Medium-range Military Transport. **Power Plants:** Two 3,400 h.p. Wright R-3350-89W radials. **Weights:** Empty, 39,982 lb.; loaded, 74,400 lb. **Performance:** Max. speed, 296 m.p.h. at 17,000 ft.; cruising (70% power), 200 m.p.h.; initial climb, 750 ft./min.; range (maximum fuel), 2,280 mls.; max. range (with auxiliary tanks), 3,480 mls. **Dimensions:** Span, 109 ft. 3 in.; length, 86 ft. 6 in.; height, 26 ft. 3 in.; wing area, 3,150 sq. ft.

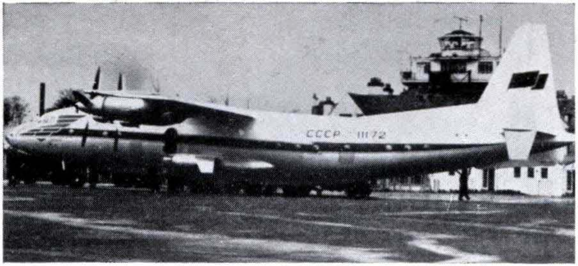


S.U.C.11G COURLIS

The S.U.C.11G Courlis (Curlew) is a modernised and extensively modified version of the S.U.C.10, 135 examples of which were built by the S.E.C.A.N. concern in the late 'forties. Whereas the S.U.C.10 was powered by a 180 h.p. Mathis SGR or 175 h.p. Mathis 8G-40 and with such was seriously underpowered, the S.U.C.11G has a more powerful Continental engine driving a Hartzell airscrew, and it is proposed to modify the existing stock of eighty S.U.C.10s to S.U.C.11G standards.

Nationality: French. **Type:** Four-seat Civil Cabin Monoplane. **Power Plant:** One 240 h.p. Continental O-470-M engine. **Weights:** Empty, 2,200 lb.; loaded, 3,500 lb. **Performance:** Max. speed, 145 m.p.h.; cruising, 125 m.p.h. **Dimensions:** Span, 37 ft. 8 in.; length, 26 ft. 10 in.; height, 8 ft. 9½ in.

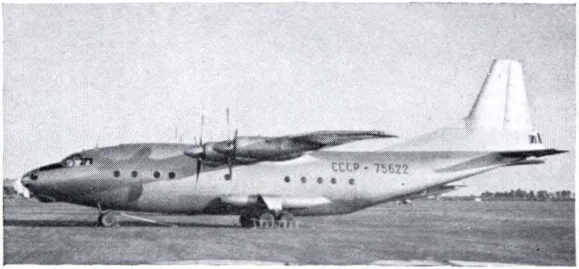




ANTONOV AN-10A UKRAINA (CAT)

Evolved from the 84-passenger An-10, the An-10A has been progressively introduced on Aeroflot services in 1960–1. The original An-10 suffered a number of teething troubles which resulted in a protracted period of evaluation as a cargo transport before it was accepted for scheduled passenger services.

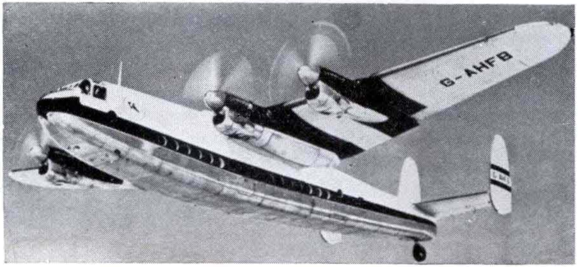
Nationality: Russian. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 4,000 e.h.p. Ivchenko AI-20 turboprops. **Accommodation:** 101 passengers. **Weights:** Normal loaded, 110,000 lb.; max., 121,500 lb. **Performance:** Max. cruising, 395 m.p.h. at 26,000 ft.; econ. cruising, 370 m.p.h. at 19,700–32,800 ft.; range (32,000-lb. payload), 1,240 mls., (23,000-lb. payload), 1,927 mls. **Dimensions:** Span, 124 ft. 8½ in.; length, 121 ft. 3½ in.; height, 32 ft. 1¼ in.; wing area, 1,293 sq. ft.



ANTONOV AN-12 (CAT-B)

The An-12 military transport derived from the commercial An-10A appeared in 1960, and currently serves with the A.V.D.V. and other Soviet military transport elements. It has also been ordered for the Indian Air Force. The An-12 differs from the An-10A primarily in having a completely new rear fuselage incorporating an integral loading ramp, revised tail surfaces, and a tail gun position. Three were presented to Ghana.

Nationality: Russian. **Type:** Medium-range Military Transport. **Power Plants:** Four 4,000 e.h.p. Ivchenko AI-20 turboprops. **Weight:** Approx. max. loaded, 125,000 lb. **Performance:** This may be assumed to be generally similar to that of the commercial An-10A. **Dimensions:** Span, 124 ft. 8½ in.; length, 121 ft.; height, 32 ft.; wing area, 1,293 sq. ft.



AVRO 685 YORK

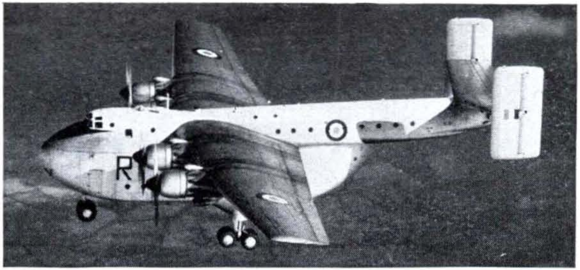
Derived from the Lancaster and retaining many of the components of the bomber, the York was first flown in 1942, and production terminated in April 1948 with the 253rd machine. It is believed that only twenty-two Yorks remain in commercial service, these being operated by Dan-Air, L.I.A., M.E.A., Skyways, Trans-Air and Trans-Mediterranean for freighting purposes.

Nationality: British. **Type:** Medium-range Commercial Freighter. **Power Plants:** Four 1,620 h.p. Rolls-Royce Merlin 24 engines. **Weights:** Empty, 39,458 lb.; max. loaded, 71,000 lb. **Performance:** Max. speed, 306 m.p.h. at 10,800 ft., 284 m.p.h. at sea level; cruising, 251 m.p.h. at 10,500 ft.; range (with 8,500-lb. payload), 2,700 mls. **Dimensions:** Span, 102 ft.; length, 76 ft. 10 in.; height, 17 ft. 10 in.; wing area, 1,297 sq. ft.

BLACKBURN BEVERLEY C.1

The Beverley C.1 entered service with the R.A.F. Transport Command in 1955, and the forty-seventh and last aircraft of this type was completed in 1958. Thirty-two currently serve with Transport Command, these being operated by Nos. 47 and 53 Squadrons. Ninety-four men can be carried for trooping.

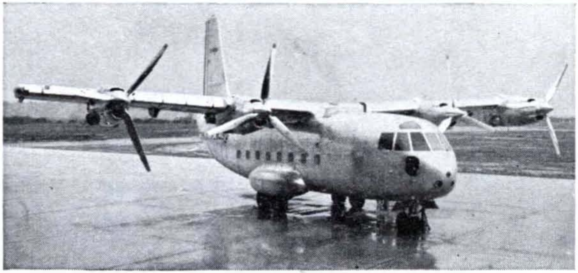
Nationality: British. **Type:** Short- and Medium-range Heavy Duty Freighter. **Power Plants:** Four 2,850 h.p. Bristol Centaurus 173. **Weights:** Empty, 82,100 lb.; loaded, 135,000 lb.; max., 143,000 lb. **Performance:** Max. speed, 238 m.p.h. at 5,700 ft.; cruising (at 125,000 lb.), 182 m.p.h. at 8,000 ft.; max. range (1,000-lb. payload), 3,690 mls. at 188 m.p.h.; (with 44,000-lb. payload), 200 mls. at 145 m.p.h. **Dimensions:** Span, 162 ft.; length, 99 ft. 5 in.; height, 37 ft. 6 in.; wing area, 2,916 sq. ft.



BREGUET 941

The Breguet 941, which commenced trials in May 1961, is a unique S.T.O.L. transport intended for both civil and military applications. A prototype was ordered by the Armée de l'Air on February 22, 1960, and proposed versions include the Br.941M freighter and Br.941C in which the rear loading ramp is replaced by a retractable stair.

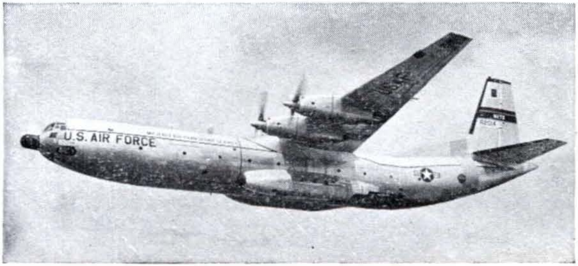
Nationality: French. **Type:** Short-range S.T.O.L. Transport. **Power Plants:** Four 1,250 s.h.p. Turboméca Turmo IIID shaft turbines. **Weights:** Empty, 24,250 lb.; max. loaded, 44,090 lb. **Performance:** Max. cruising, 271 m.p.h.; max. range (with 6,600-lb. payload), 1,400 mls.; take-off distance (to 35 ft. at max. loaded weight), 771 ft. **Dimensions:** Span, 76 ft. 1 in.; length, 74 ft. 8½ in.; height, 30 ft. 8½ in.; wing area, 887 sq. ft.

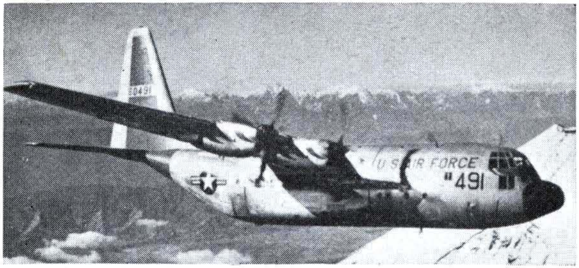


DOUGLAS C-133B CARGOMASTER

The C-133B, fifteen examples of which have been delivered to the U.S.A.F., is essentially similar to the earlier C-133A apart from the power plants which were T34-P-3s, and relatively minor structural changes. Thirty-five C-133As were built, and both versions can carry Atlas intercontinental missiles.

Nationality: American. **Type:** Heavy Military Freight and Personnel Transport. **Power Plants:** Four 6,500 e.h.p. (7,500 e.h.p. wet) Pratt and Whitney T34-P-9W turboprops. **Weights:** Empty, 120,263 lb.; loaded, 286,000 lb.; max., 300,000 lb. **Performance:** Max. speed, 359 m.p.h. at 8,700 ft.; initial climb, 1,350 ft./min.; range (with 51,845-lb. payload), 4,030 mls. at 328 m.p.h. at 23,400 ft. **Dimensions:** Span, 179 ft. 7¾ in.; length, 157 ft. 6½ in.; height, 48 ft. 3 in.; wing area, 2,673 sq. ft.

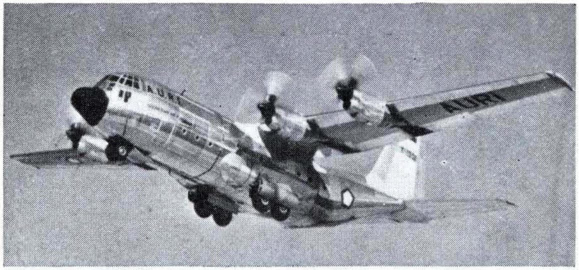




LOCKHEED C-130A HERCULES

Deliveries of the C-130A multi-purpose tactical transport to the U.S.A.F. began in December 1956, production being completed in February 1959 with the 231st machine. Twelve were delivered to the R.A.A.F., two were modified as GC-130A drone launcher and director aircraft, sixteen were completed as RC-130A photographic aircraft, and twelve were fitted with JATO, wheel/ski undercarriages and underwing fuel tanks as C-130Ds.

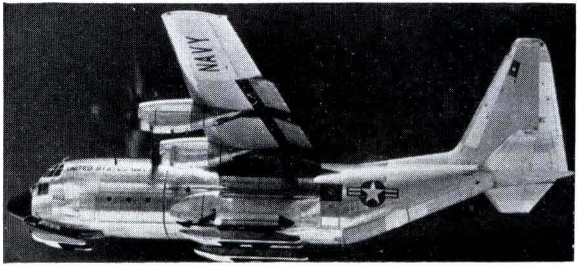
Nationality: American. **Type:** Medium Tactical Transport. **Power Plants:** Four 3,750 e.s.h.p. Allison T56-A-1A turboprops. **Weights:** Empty, 59,400 lb.; max., 124,200 lb. **Performance:** Max. cruising, 360 m.p.h.; initial climb (at 120,000 lb.), 2,400 ft./min.; service ceiling, 40,000 ft. **Dimensions:** Span, 132 ft. 7¼ in.; length, 97 ft. 8½ in.; height, 38 ft.; wing area, 1,745 sq. ft.



LOCKHEED C-130B HERCULES

A strengthened and more powerful version of the C-130A, the C-130B serves with the U.S.A.F., the R.C.A.F., and the Indonesian Air Force. Sixteen assault transports basically similar to the C-130B have been supplied to the U.S. Marine Corps as the GV-1, and six search and rescue models serving with the U.S. Coast Guard are known as SC-130Bs. Ninety-nine examples of a long-range version, the C-130E, have been ordered for M.A.T.S.

Nationality: American. **Type:** Medium Tactical Transport. **Power Plants:** Four 4,050 e.s.h.p. Allison T56-A-7A turboprops. **Weights:** Empty 67,700 lb.; max. loaded, 135,000 lb. **Performance:** Max. speed, 385 m.p.h.; econ. cruising, 350 m.p.h.; range (22,700-lb. payload), 4,000 mls., (36,700- lb. payload), 2,450 mls.; initial climb, 2,450 ft./min. **Dimensions:** As for C-130A.



LOCKHEED C-130BL HERCULES

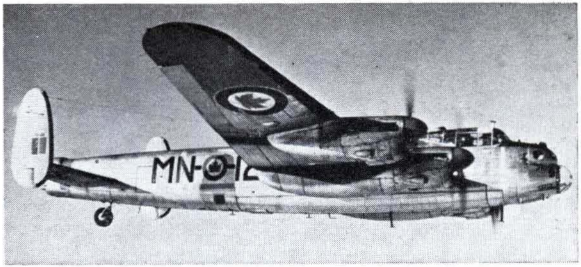
The C-130BL has been developed for transport operations in the Antarctic, and is operated by the U.S. Navy's VX-6 Squadron. The C-130BL is fitted with eight 1,000-lb. JATO units for assisting take-off at high altitudes or in overload condition, and a special wheel/ski undercarriage is provided to enable the transport to operate from rough fields or snow. The first C-130BL was delivered to the U.S. Navy on August 4, 1960.

Nationality: American. **Type:** Multi-purpose Freight and Personnel Transport. **Power Plants:** Four 4,050 e.s.h.p. Allison T56-A-7 turboprops. **Weight:** Max. loaded, 135,000 lb. **Performance:** Max. cruising, 360 m.p.h.; econ. cruising, 335 m.p.h.; range (17,200-lb. payload), 3,250 mls. **Dimensions:** As for C-103A.

AVRO LANCASTER 10-PR

Very few Lancasters now remain in service, although No. 408 Squadron of the R.C.A.F. operates a number of photographic Lancaster 10-PR aircraft, these being the survivors of the 430 Lancaster 10s built in Canada by Victory Aircraft. France's Aéronavale received fifty-four Lancaster B.1s and B.7s modified for maritime reconnaissance in 1952, and several of these remain in service as trainers.

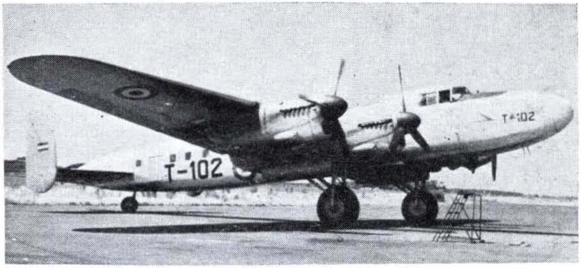
Nationality: Canadian. **Type:** Long-range Photographic Aircraft. **Power Plants:** Four 1,340 h.p. Packard-built Merlin 28, 38 or 224 engines. **Weights:** Empty, 41,000 lb.; max., 68,000 lb. **Performance:** Max. speed, 264 m.p.h. at 19,000 ft.; cruising, 210 m.p.h.; normal range, 2,250 mls. **Dimensions:** Span, 102 ft.; length, 68 ft. 11 in.; height, 19 ft. 6 in.; wing area, 1,297 sq. ft.



AVRO LANCASTRIAN

The Lancastrian is a high-speed long-range transport conversion of the Lancaster bomber in which the tail and nose turrets are replaced by streamlined fairings and a passenger cabin provided. A small number of Lancastrians remain in service with the Argentine Air Force's 1st and 5th Air Brigades, these being used principally to carry diplomatic mail between Argentina and neighbouring countries. One of these is illustrated.

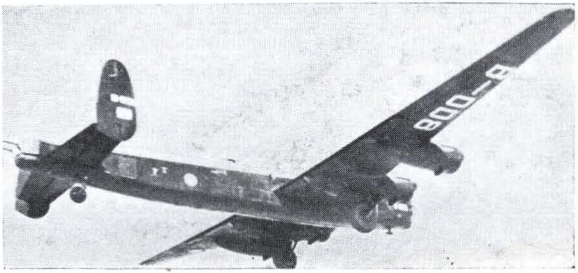
Nationality: British. **Type:** Long-range Transport. **Power Plants:** Four 1,620 h.p. Rolls-Royce Merlin 24. **Weights:** Empty, 36,190 lb.; loaded, 61,860 lb.; max. 65,000 lb. **Performance:** Max. speed (at 54,000 lb.), 315 m.p.h. at 12,000 ft.; range, 2,820 mls. at 230 m.p.h. at 30,000 ft. **Dimensions:** Span, 102 ft.; length, 76 ft. 10 in.; height, 17 ft. 10 in.; wing area, 1,297 sq. ft.

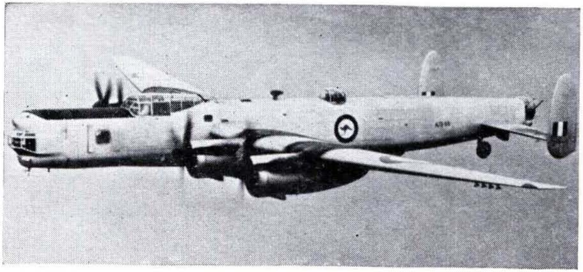


AVRO LINCOLN B.1

The Lincoln was the last piston-engined bomber to serve with the R.A.F., some remaining in first-line squadrons until the end of December 1955. Twelve Lincoln B.1s were delivered to the Argentine Air Force in 1946–8, and the remaining bombers of this type currently serve with the 1st Bombing Group of that air arm's 5th Air Brigade, one of these being illustrated. Several Lincoln B.2s serve with the R.A.F., and two were converted to Lincoln U.5 target drones early in 1961.

Nationality: British. **Type:** Long-range Medium Bomber. **Power Plants:** Four 1,750 h.p. Rolls-Royce Merlin 85 engines. **Weight:** Loaded, 75,000 lb. **Performance:** Max. speed, 319 m.p.h. at 18,000 ft. **Dimensions:** As for M.R.30 apart from length of 78 ft. 3½ in.

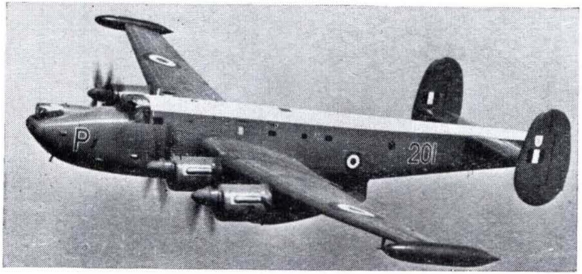




AVRO LINCOLN M.R.30

Lincoln M.R.30s are currently in service with the R.A.A.F.'s No. 10 Squadron on maritime reconnaissance duties but are scheduled to be replaced between January and April 1962 by the P2V-7 Neptune. Seventy-three Lincoln B.30s were built by the Australian Department of Aircraft Production, and a number of these were fitted with an additional section in the nose to house two crew members and search radar as Lincoln M.R.30s.

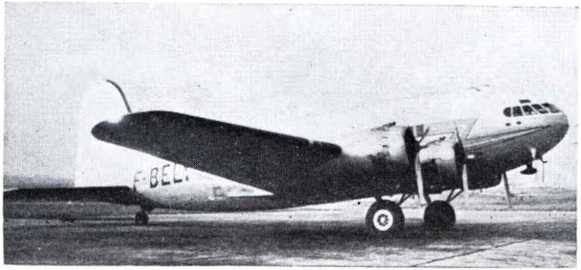
Nationality: Australian. **Type:** Long-range Maritime Reconnaissance Bomber. **Power Plants:** Four 1,750 h.p. C.A.C.-built Merlin 102 engines. **Weight:** Loaded, 78,000 lb. **Performance:** Max. speed, 310 m.p.h.; range, 2,930 mls. at 210 m.p.h. **Dimensions:** Span, 120 ft.; length, 84 ft. 3 in.; height, 17 ft. 10 in.; wing area, 1,421 sq. ft.



AVRO SHACKLETON M.R.3

The Shackleton is the standard maritime reconnaissance aircraft of the R.A.F., and the M.R.2c version is operated by Nos. 42, 204, 210 and 224 Squadrons, while the later M.R.3 serves with Nos. 120, 201, 203 and 206 Squadrons in Coastal Command. The M.R.3 differs from the M.R.2c principally in having a nosewheel undercarriage, wingtip tanks, and other changes.

Nationality: British. **Type:** Maritime Reconnaissance Bomber. **Power Plants:** Four 2,450 h.p. Rolls-Royce Griffon 57A engines. **Armament:** Two 20-mm. cannon and various warloads. **Weights:** Empty, 57,800 lb.; max., 100,000 lb. **Performance:** Max speed, 260 m.p.h. at 12,000 ft.; range, 3,662 mls. at 200 m.p.h. at 1,500 ft. **Dimensions:** Span, 119 ft. 10 in.; length, 92 ft. 6 in.; height, 23 ft. 4 in.; wing area, 1,421 sq. ft.



BOEING SA-307B STRATOLINER

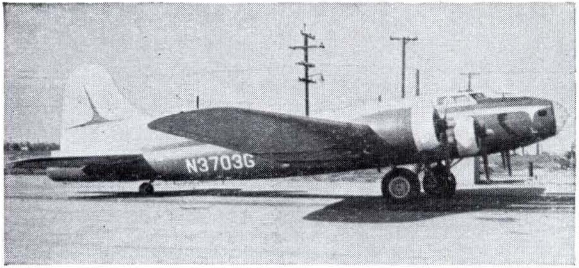
Although the Stratoliner was designed in 1936 and only ten were built, nine of these are still operating on commercial services, and the tenth is operated by the Haitian Air Corps. The ten Stratoliners included one SB-307B, four S-307s and five SA-307Bs, all examples of the last-mentioned model being fitted with B-17G Fortress wings, a B-17G undercarriage and Wright GR-1820-G205A engines in 1944.

Nationality: American. **Type:** Commercial Transport. **Power Plants:** Four 1,200 h.p. Wright GR-1820-G205A radials. **Accommodation:** 38 passengers. **Weights:** Empty, 32,500 lb.; loaded, 48,200 lb. **Performance:** Max. speed, 244 m.p.h. at 6,000 ft.; cruising, 215 m.p.h. at 10,000 ft. **Dimensions:** Span, 107 ft.; length, 74 ft. 4 in.; height, 20 ft. 9½ in.; wing area, 1,402 sq. ft.

BOEING B-17G FORTRESS

Of the 12,731 B-17 Fortress bombers produced during 1935–45 a small number remain airworthy. Apart from a few B-17Gs serving with the air arm of the Dominican Republic, most remaining Fortresses have been converted for civil duties, ranging from executive transport and aerial photography rôles to crop spraying. The accompanying photograph illustrates a B-17F executive transport and the specification relates to the B-17G.

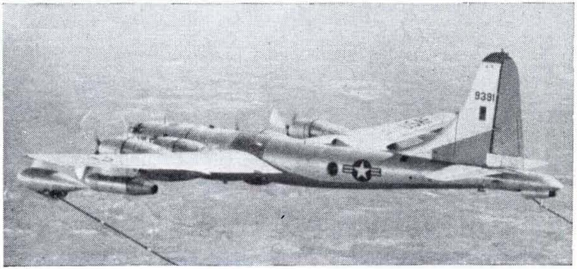
Nationality: American. **Type:** Long-range Executive Transport. **Power Plants:** Four 1,200 h.p. Wright R-1820-97 radials. **Weights:** 30,000–35,000 lb.; max. loaded, 55,000 lb. **Performance:** Max. speed, 305 m.p.h.; cruising, 160 m.p.h. **Dimensions:** Span, 103 ft. 9 in.; length, 74 ft. 9 in.; height, 19 ft. 1 in.; wing area, 1,420 sq. ft.



BOEING KB-50J SUPERFORTRESS

Serving primarily with the U.S.A.F. Tactical Air Command, the KB-50J is a conversion of the Superfortress heavy bomber by the Hayes Aircraft Corporation as a three-point flight refuelling tanker. The KB-50J has been completely redesigned internally and the airframe has been re-manufactured.

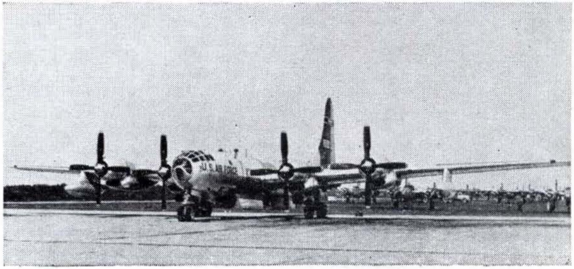
Nationality: American. **Type:** Flight Refuelling Tanker. **Power Plants:** Four 3,500 h.p. Pratt and Whitney R-4360-35 radials and two 5,900 lb.s.t. General Electric J47 turbojets. **Weight:** Max. loaded, 173,000 lb. **Performance:** Average cruising speed, 263 m.p.h. at 5,000 ft.; refuelling speed, 418 m.p.h.; initial climb, 1,375 ft./min.; service ceiling, 33,500 ft.; combat radius, 1,150 mls. 9·9 hr. **Dimensions:** Span, 141 ft. 2 in.; length, 105 ft. 2 in.; height, 33 ft. 6 in.; wing area, 1,769 sq. ft.

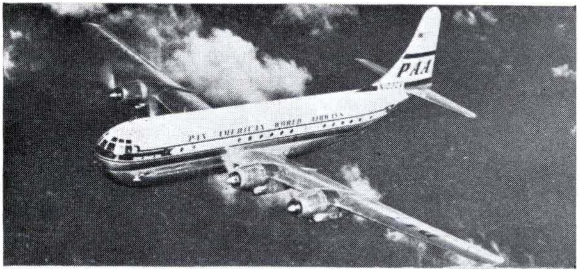


BOEING WB-50D SUPERFORTRESS

A substantial number of B-50D Superfortress heavy bombers were converted for use by the Air Weather Service of the U.S.A.F.'s Military Air Transport Service as WB-50D weather reconnaissance machines, and several squadrons are currently equipped with this type. The WB-50D carries extensive weather recording instrumentation.

Nationality: American. **Type:** Long-range Weather Reconnaissance Aircraft. **Power Plants:** Four 3,500 h.p. Pratt and Whitney R-4360-35 radials. **Weight:** Loaded, 164,500 lb. **Performance:** Max. speed, 405 m.p.h. at 30,000 ft.; average cruising, 272 m.p.h.; service ceiling, 43,000 ft.; max. continuous cruising, 358 m.p.h.; endurance, 11·5 hr. **Dimensions:** As for KB-50J above.

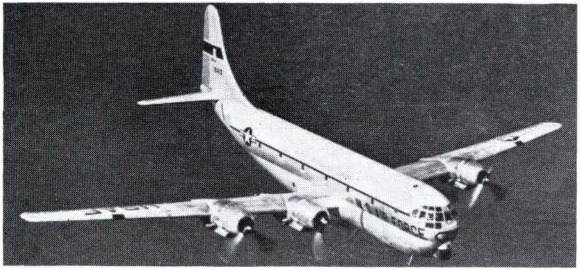




BOEING 377 STRATOCRUISER

The civil counterpart of the military Stratofreighter, the Stratocruiser is currently operated by Pan American World Airways and Northwest Airlines, and of the fifty-five built and delivered between January 1949 and March 1950, some twenty-one remain in service. The wing, tail surfaces and landing gear of the Stratocruiser are basically similar to those of the B-50.

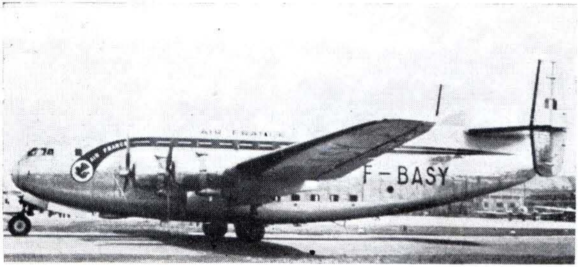
Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 2,800 h.p. (3,500 h.p. wet) Pratt and Whitney R-4360-TSB3-G radials. **Weights:** Empty, 83,500 lb.; loaded, 145,800 lb. **Performance:** Max. speed, 375 m.p.h. at 25,000 ft.; max. cruising, 340 m.p.h. at 25,000 ft.; range (max. fuel), 4,600 mls. **Dimensions:** Span, 141 ft. 3 in.; length, 110 ft. 4 in.; height, 38 ft. 3 in.; wing area, 1,769 sq. ft.



BOEING C-97G STRATOFREIGHTER

The majority of the 888 Stratofreighters built for the U.S.A.F. were completed as convertible tanker-transports (sixty KC-97Es, 159 KC-97Fs and 590 KC-97Gs), but having been largely supplanted in the tanker rôle by the KC-135A, many KC-97Gs are having their refuelling equipment removed and, as C-97Gs, are serving with the Air National Guard and M.A.T.S.

Nationality: American. **Type:** Long-range Military Transport. **Power Plants:** Four 3,800 h.p. Pratt and Whitney R-4360-59B radials. **Weights:** Empty, 82,490 lb.; normal loaded, 153,000 lb.; max., 175,000 lb. **Performance:** Max. speed, 375 m.p.h. at 25,000 ft.; normal cruising, 297 m.p.h.; max. range, 4,300 mls. **Dimensions:** Span, 141 ft. 3 in.; length, 110 ft. 4 in.; height, 38 ft. 3 in.; wing area, 1,769 sq. ft.



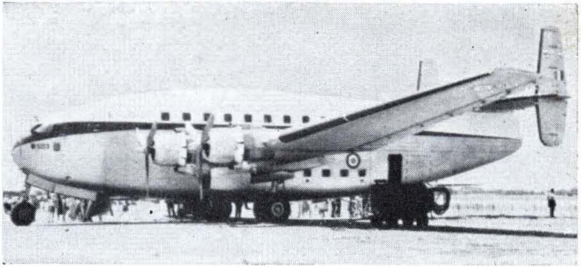
BREGUET 763 PROVENCE

Derived from the Type 761, the Type 763, popularly known as the " Deux Ponts ", flew on July 20, 1951 in which year twelve were ordered by Air France as convertible passenger/cargo aircraft. These remain in service. Fifty-nine passengers can be accommodated on the upper deck and forty-eight on the lower.

Nationality: French. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 2,400 h.p. Pratt and Whitney R-2800-CA18 radials. **Accommodation:** 107 passengers. **Weights:** Empty, 55,890 lb.; max. loaded, 113,800 lb. **Performance:** Max. cruising speed, 242 m.p.h. at 9,842 ft.; econ. cruising, 210 m.p.h.; max. range, 2,291 mls. at 217 m.p.h. at 9,840 ft.; initial climb, 740 ft./min. **Dimensions:** Span, 140 ft.; length, 94 ft. 11 in.; height, 31 ft. 4 in.; wing area, 1,996 sq. ft.

BREGUET 765 SAHARA

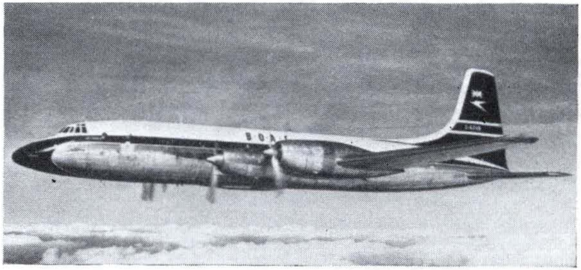
A military development of the Type 763, the Type 765 Sahara was ordered for the Armée de l'Air in 1955. Budgetary restrictions later cut the order from fifteen to four machines, the first of these flying on September 6, 1958. These currently serve alongside three Type 761S transports, these being the "pre-series" Type 761s re-engined with 2,020 h.p. Pratt and Whitney R-2800s. **Nationality:** French. **Type:** Heavy Military Freighter. **Power Plants:** Four 2,500 h.p. Pratt and Whitney R-2800-CB-17 radials. **Weights:** Empty, 68,343 lb.; max loaded, 119,050 lb. **Performance:** Max. speed (at 114,500 lb.), 230 m.p.h. at 10,000 ft., (at 103,500 lb.), 236 m.p.h.; econ. cruising, 210 m.p.h. at 9,840 ft.; max. range, 2,930 mls. **Dimensions:** Span, 141 ft. 3½ in.; length, 94 ft. 11¾ in.; height, 32 ft. 6 in.; wing area, 2,008·33 sq. ft.



BRISTOL 175 BRITANNIA 300 SRS

There are four main commercial versions of the Britannia, the 100 Series with 3,900 e.h.p. Proteus 705s and an overall length of 114 ft., fifteen of which serve with B.O.A.C.; the 300 Series with Proteus 750s and 760s and lengthened fuselage; the 310 Series with additional wing tankage, and the 320 Series with Proteus 765s. A Britannia 312 is illustrated.

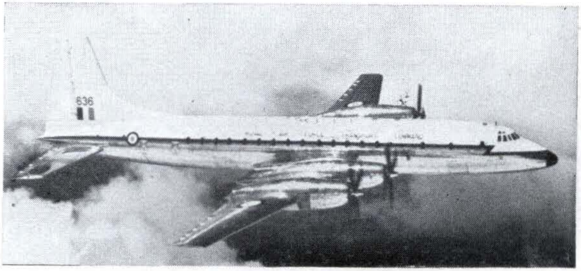
Nationality: British. **Type:** Long-range Commercial Transport. **Power Plants:** Four 4,120 e.h.p. Bristol Siddeley Proteus 755 turboprops. **Accommodation:** 84–133 passengers. **Weights:** Empty, 92,500 lb.; max. loaded, 165,000 lb. **Performance:** Normal high-speed cruising, 405 m.p.h.; long-range cruising, 355 m.p.h.; range (max. payload), 3,496 mls. **Dimensions:** Span, 142 ft. 3½ in.; length, 124 ft. 3 in.; height, 37 ft. 6 in.

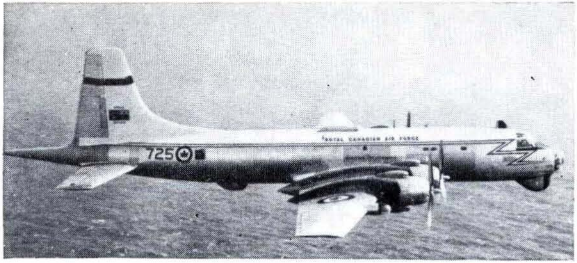


BRISTOL BRITANNIA C.1

The Britannia C.1, first flown on December 29, 1958, and now serving with Nos. 99 and 511 Squadrons of R.A.F. Transport Command, differs from the final commercial production model in having a large freight loading door and a heavy duty floor. Twenty Britannia C.1s were built, and Transport Command also operates three Britannia C.2s which have only the forward floor strengthened for heavy freighting.

Nationality: British. **Type:** Long-range Military Transport. **Power Plants:** Four 4,445 e.h.p. Bristol Siddeley Proteus 255 turboprops. **Weights:** Basic operational, 96,826 lb.; max., 185,000 lb. **Performance:** Max. speed (at 150,000 lb.), 401 m.p.h.; max. range, 5,230 mls. **Dimensions:** Span, 142 ft. 3½ in.; length, 124 ft. 3 in.; height, 36 ft. 8½ in.; wing area, 2,075 sq. ft.

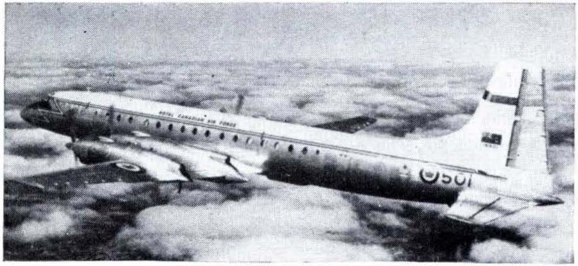




CANADAIR CL-28 ARGUS MK. 2

Employing the wings, tail surfaces, flight controls and undercarriage of the Bristol Britannia, the Argus first flew on March 28, 1957, the first thirteen production machines being Mk. 1s with U.S. search radar. The Mk. 2 employs British radar, and twenty were built for the R.C.A.F., the last flying in July 1960.

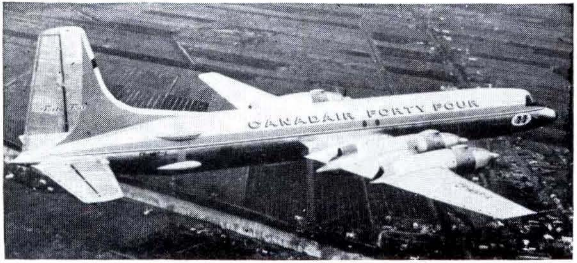
Nationality: Canadian. **Type:** Long-range Maritime Reconnaissance Aircraft. **Power Plants:** Four 3,400 h.p. (3,700 h.p. wet) Wright R-3350 TC981 EA-1 Turbo Compounds. **Armament:** 8,000-lb. ordnance load internally and up to 7,600-lb. on pylons. **Weights:** Empty, 81,000 lb.; loaded, 148,000 lb. **Performance:** Max speed, 288 m.p.h.; max. cruising, 203 m.p.h. at 5,000 ft.; patrol endurance, 12 hrs. **Dimensions:** Span, 142 ft. 3½ in.; length, 128 ft. 3 in.; height, 36 ft. 8½ in.; wing area, 2,075 sq. ft.



CANADAIR CL-44-6 (CC-106)

The CL-44, like the CL-28, was derived originally from the Britannia, but it is substantially longer than the British aircraft and possesses appreciably more power. Equipping No. 426 Squadron of the R.C.A.F. as the CC-106, the CL-44-6 is a military freight and personnel transport, and the first of twelve side-loading aircraft of this type flew on November 15, 1959.

Nationality: Canadian. **Type:** Long-range Military Freight and Personnel Transport. **Power Plants:** Four 5,730 e.h.p. Rolls-Royce Tyne 515/10 turboprops. **Weight:** Design loaded, 205,000 lb. **Performance:** Long-range cruising speed, 380 m.p.h. at 30,000 ft.; range (max. payload—60,480 lb.), 2,360 mls., (max. fuel), 4,490 mls. **Dimensions:** Span, 142 ft. 3⅔ in.; length, 136 ft. 10¾ in.; height, 36 ft. 7¾ in.; wing area, 2,075 sq. ft.



CANADAIR CL-44D-4

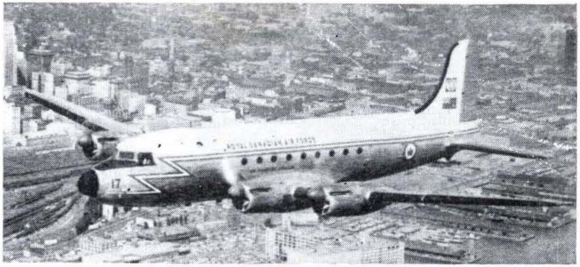
The first commercial freighter version of the basic CL-44 design, the CL-44D-4 flew for the first time on November 16, 1960, and this type has been ordered by the Flying Tiger Line, Seaboard and Western, and Slick Airways. It differs from the military CL-44-6 principally in having a hinged rear fuselage which permits straight-in loading without any adverse effect on performance.

Nationality: Canadian. **Type:** Long-range Commercial Freight Transport. **Power Plants:** Four 5,730 e.h.p. Rolls-Royce Tyne 515/10 turboprops. **Weights:** Empty, 86,889 lb.; max., 205,000 lb. **Performance:** Max. cruising (165,000 lb.), 391 m.p.h. at 20,000 ft.; econ. cruising, 368 m.p.h. at 30,000 ft.; range (66,480-lb. payload), 5,205 mls. **Dimensions:** Span, 142 ft. 3⅔ in.; length, 136 ft. 10¾ in.; height, 36 ft. 7¾ in.; wing area, 2,075 sq. ft.

CANADAIR C-54-GM (DC-4M) NORTH STAR

The Canadair C-54-GM, or CL-2, embodies features of both the Douglas DC-4 and DC-6. In commercial service it is known as the DC-4M-1 and -2. Thirty-six serve with commercial airlines, four ex-B.O.A.C. machines serve with the Royal Rhodesian Air Force, and twenty-four have been operated by the R.C.A.F., six of these being former T.C.A. machines.

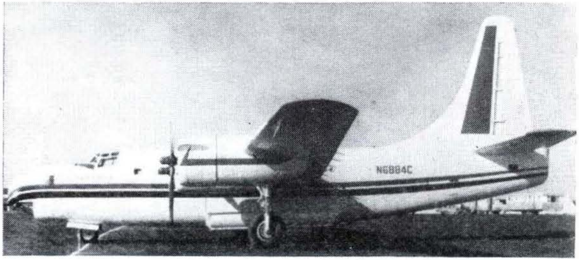
Nationality: Canadian. **Type:** General-purpose Commercial and Military Transport. **Power Plants:** Four 1,760 h.p. Rolls-Royce Merlin 620 engines. **Weights:** Max. cruising, 325 m.p.h. at 25,200 ft.; service ceiling (at 80,200 lb.), 26,400 ft.; absolute range (at 82,300 lb.), 3,880 mls. at 10,000 ft. **Dimensions:** Span, 117 ft. 6 in.; length, 93 ft. 7½ in.; height, 27 ft. 6¼ in.; wing area, 1,457 sq. ft.



CONVAIR P4Y-2 PRIVATEER

Although the Privateer is no longer in operational service, a substantial number of aircraft of this type have been converted as transports. One of these, owned by International Air Applicators, is illustrated, and another, owned by the Honduran Air Force, is illustrated on page 32. Many P4Y-2 transport conversions operate in Latin America.

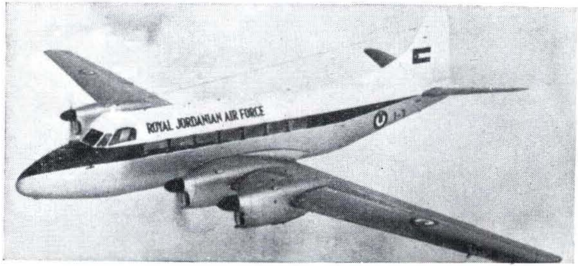
Nationality: American. **Type:** Medium-range Commercial Freighter. **Power Plants:** Four 1,350 h.p. Pratt and Whitney R-1830-94 radials. **Weights:** Empty, 37,485 lb.; loaded, 65,000 lb. **Performance:** Max. speed, 237 m.p.h. at 20,000 ft.; cruising speed, 180 m.p.h. at 8,500 ft.; range, 1,700–3,000 mls. at 165–172 m.p.h. **Dimensions:** Span, 110 ft.; length, 74 ft. 7 in.; height, 26 ft.; wing area, 1,048 sq. ft.

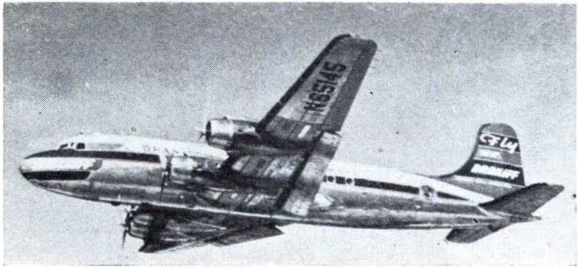


DE HAVILLAND D.H.114 HERON

More than 150 Herons have been built of which some seventy are in airline service. The Heron Srs. 1 with the fixed nosewheel undercarriage is no longer in production, and the specification relates to the Srs. 2 with the retractable undercarriage. Herons are used by several air forces, that illustrated belonging to Jordan. Three Herons are operated by The Queen's Flight.

Nationality: British. **Type:** Light Transport and Executive Aircraft. **Power Plants:** Four 250 h.p. de Havilland Gipsy Queen 30 Mk. 2 engines. **Accommodation:** 14–17 passengers. **Weights:** Empty, 8,484 lb.; loaded, 13,500 lb. **Performance:** Cruising speed, 183 m.p.h. at 8,000 ft.; initial climb, 1,075 ft./min.; typical range, 800 mls. **Dimensions:** Span, 71 ft. 6 in.; length, 48 ft. 6 in.; height, 15 ft. 7 in.; wing area, 499 sq. ft.

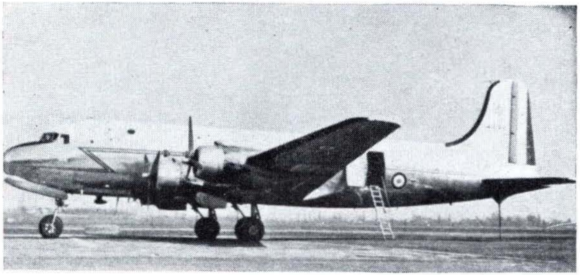




DOUGLAS DC-4

Although production of the DC-4 terminated in August 1947, this aircraft is still one of the most widely used of commercial transports, some 350 currently being in airline service. A total of 1,163 DC-4s was built of which 1,084 were military C-54s, the remaining seventy-nine being post-war commercial models. Many C-54s were converted to commercial DC-4 standards.

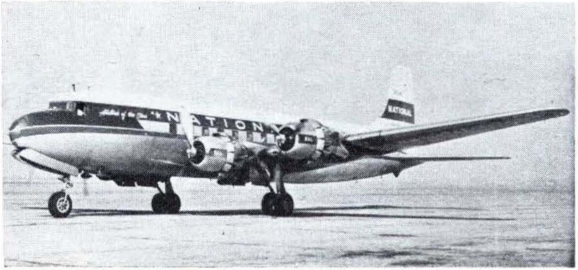
Nationality: American. **Type:** Long- and Medium-range Commercial Transport. **Power Plants:** Four 1,450 h.p. Pratt and Whitney Twin Wasp 2SD13-G radials. **Accommodation:** 44 passengers. **Weight:** Max. loaded, 73,000 lb. **Performance:** Normal cruising speed, 227 m.p.h. at 10,000 ft., 246 m.p.h. at 20,800 ft.; normal range, 3,300 mls. **Dimensions:** As for Douglas C-54.



DOUGLAS C-54 SKYMASTER

The military version of the DC-4, the C-54 was produced in several variants all of which had the 1,350 h.p. R-2000-3, -7 or -11 engines apart from the final production model, the C-54G which had 1,450 h.p. R-2000-9 engines. The C-54 currently serves with air forces of Argentina, Belgium, Colombia, Denmark, France, Portugal, Thailand, and Venezuela.

Nationality: American. **Type:** Long- and Medium-range Military Transport. **Power Plants:** Four 1,350 h.p. Pratt and Whitney R-2000-3 or -7 radials. **Weights:** Empty, 38,200 lb.; max. loaded, 73,000 lb. **Performance:** Max. speed, 274 m.p.h. at 14,000 ft.; max. cruising, 239 m.p.h. at 15,200 ft.; initial climb, 1,070 ft./min. **Dimensions:** Span, 117 ft. 6 in.; length, 93 ft. 11 in.; height, 27 ft. 6¼ in.; wing area, 1,457 sq. ft.

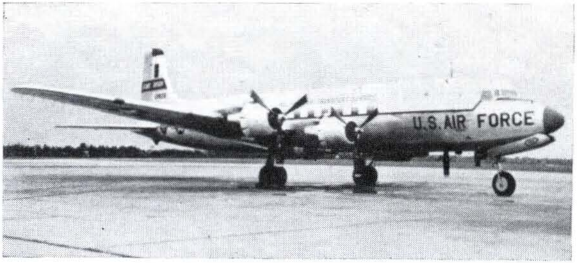


DOUGLAS DC-6

Development of the DC-6 began towards the end of the war, the first prototype actually being a military transport, the XC-112. The second prototype was a commercial model, and the DC-6 differed from the earlier DC-4 primarily in being 7 ft longer, fully pressurised and some 24,900 lb. heavier in laden weight. Of the 175 DC-6s built some 160 are currently in airline use.

Nationality: American. **Type:** Long- and Medium-range Commercial Transport. **Power Plants:** Four 2,100 h.p. (2,400 h.p. wet) Pratt and Whitney Double Wasp R-2800-CA-15 radials. **Accommodation:** 48-58 passengers. **Weights:** Empty, 51,495 lb.; loaded, 97,200 lb. **Performance:** Max. speed, 365 m.p.h. at 19,600 ft.; cruising, 313 m.p.h. at 20,400 ft. **Dimensions:** Span, 117 ft. 6 in.; length, 100 ft. 7 in.; height, 28 ft. 5 in.

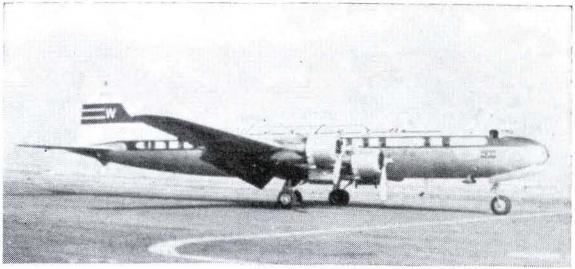
DOUGLAS C-118A (R6D-1)



The C-118A is the military counterpart of the commercial DC-6A freighter which employs the wings, tail assembly and landing gear of the DC-6 but an entirely new and longer fuselage and more powerful engines. Featuring large freight loading doors fore and aft of the wings, the C-118A serves with M.A.T.S. and, as the R6D-1, with U.S. Navy Fleet Logistic Air Wings. One hundred and one C-118As and sixty-five R6D-1s were built.

Nationality: American. **Type:** Military Transport. **Power Plants:** Four 2,500 h.p. Pratt and Whitney R-2800-52W radials. **Weights:** Empty, 49,760 lb.; loaded, 107,000 lb. **Performance:** Max. speed, 360 m.p.h. at 18,000 ft.; cruising, 307 m.p.h. at 22,400 ft.; max. range, 4,910 mls. **Dimensions:** Span, 117 ft. 6 in.; length, 105 ft. 7 in.; height, 28 ft. 5 in.; wing area, 1,463 sq. ft.

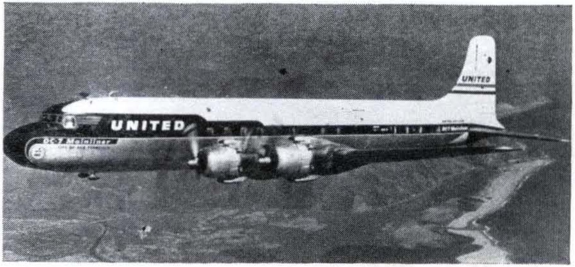
DOUGLAS DC-6B



The DC-6B is a passenger version of the DC-6A freighter which was built in domestic, trans-oceanic and high-density models. Two hundred and eighty-seven DC-6Bs were built of which more than 260 are in airline service. The DC-6C is basically similar to the DC-6B but convertible for passenger or cargo loads.

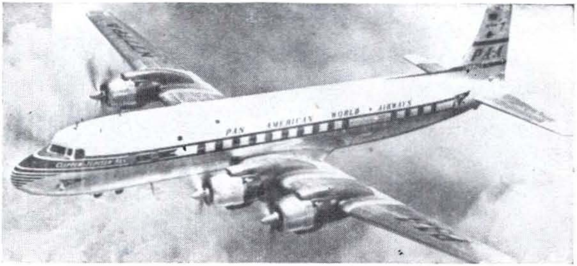
Nationality: American. **Type:** Long- and Medium-range Commercial Transport. **Power Plants:** Four 2,500 h.p Pratt and Whitney R-2800-CB17 radials. **Accommodation:** 64–92 passengers. **Weights:** Empty, 54,148 lb.; max. loaded, 106,000 lb. **Performance:** Max. speed, 362 m.p.h. at 18,500 ft.; cruising, 311 m.p.h. at 20,600 ft.; initial climb, 1,010 ft./min.; normal range, 3,560 mls. at 280 m.p.h. **Dimensions:** Span, 117 ft. 6 in.; length, 105 ft. 7 in.; height, 28 ft. 5 in.; wing area, 1,463 sq. ft.

DOUGLAS DC-7



An evolutionary development of the DC-6B which it resembles both aerodynamically and structurally, the DC-7 is just over 3 ft. longer but, despite an increase in gross weight of some 15,000 lb., retains the same wing area and span. One hundred and twenty DC-7s were built together with ninety-seven DC-7Bs, the latter being an intercontinental version with R-3350-18DA4 engines.

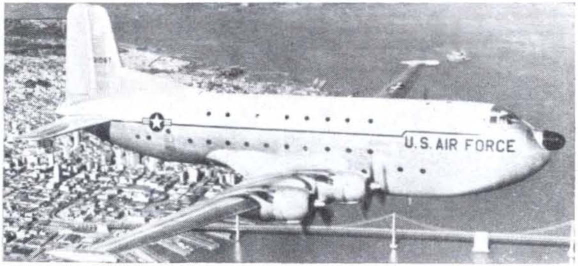
Nationality: American. **Type:** Long- and Medium-range Commercial Transport. **Power Plants:** Four 3,250 h.p. Wright R-3350-18DA1 Turbo Compound radials. **Accommodation:** 60–95 passengers. **Weights:** Empty, 66,306 lb.; max. loaded, 122,200 lb. **Performance:** Max. speed, 410 m.p.h. at 22,200 ft.; max. cruising, 365 m.p.h. **Dimensions:** Span, 117 ft. 6 in.; length, 108 ft. 11 in.; height, 28 ft. 7 in.; wing area, 1,463 sq. ft.



DOUGLAS DC-7C

The final production development of the series of commercial transports, the DC-7C is an improved version of the long-range DC-7B with increased wing span and area and extra fuel capacity. One hundred and twenty-one DC-7Cs were built, and a number of these are currently being converted to DC-7F freighters.

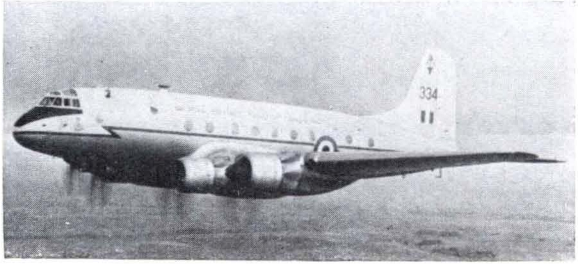
Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 3,400 h.p. Wright R-3350-18EA1 Turbo Compound radials. **Accommodation:** 62–99 passengers. **Weights:** Empty, 72,763 lb.; max. loaded, 143,000 lb. **Performance:** Max. speed (at 107,000 lb.), 406 m.p.h. at 22,700 ft.; recommended max. cruising, 346 m.p.h. at 21,600 ft.; range (max. fuel), 5,635 mls. at 274 m.p.h. **Dimensions:** Span, 127 ft. 6 in.; length, 112 ft. 3 in.; height, 31 ft. 8 in.; wing area, 1,637 sq. ft.



DOUGLAS C-124C GLOBEMASTER II

One of the largest of the world's current military transports, the C-124C differs from the initial production C-124A primarily in having more powerful engines. The C-124C has a rear cargo hatch with cargo elevator, and nose loading doors with vehicle ramps. A total of 445 Globemasters was built.

Nationality: American. **Type:** Military Cargo and Troop Transport. **Power Plants:** Four 3,800 h.p. Pratt and Whitney R-4360-63A radials. **Weights:** Empty, 101,165 lb.; normal loaded, 185,000 lb.; max., 194,500 lb. **Performance:** Max. speed, 304 m.p.h. at 20,800 ft.; initial climb, 760 ft./min.; service ceiling, 22,100 ft.; range, 2,000 mls.; max., 6,820 mls. **Dimensions:** Span, 174 ft. 1½ in.; length, 130 ft. 5 in.; height, 48 ft. 3½ in.; wing area, 2,506 sq. ft.



HANDLEY PAGE HASTINGS C.2

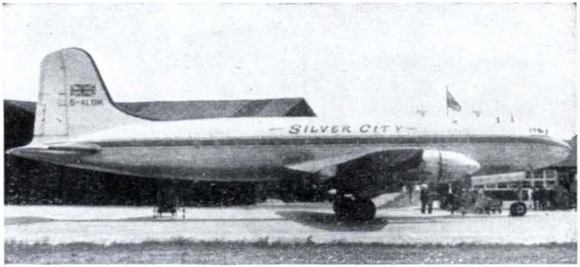
Forty-eight Hastings C.1A and C.2 transports currently serve with R.A.F. Transport Command (the C.1A being the initial production model brought up to C.2 standards). Four similar machines operate with the R.N.Z.A.F. as the Hastings C.3, and other variants in service include the C.4 V.I.P. transport, the T.5 bomber crew trainer, and the Met.1 meteorological aircraft.

Nationality: British. **Type:** Long-range Military Transport. **Power Plants:** Four 1,675 h.p. Bristol Hercules 106 radials. **Weights:** Empty, 48,427 lb.; max. loaded, 80,000 lb. **Performance:** Max. speed, 348 m.p.h. at 22,200 ft.; cruising, 302 m.p.h. at 23,600 ft.; initial climb, 890 ft./min.; range (20,311-lb. payload), 1,690 mls. **Dimensions:** Span, 113 ft.; length, 82 ft. 1 in.; height, 22 ft. 6 in.; wing area, 1,408 sq. ft.

HANDLEY PAGE HERMES 4

The first modern British post-war airliner, the Hermes was a commercial development of the Hastings, and of the twenty-five Hermes 4s built, fourteen remain in service with Air Safaris, Silver City, Skyways and Bahamas. The Hermes 4 differs from the Hastings primarily in having a longer fuselage and a nosewheel undercarriage.

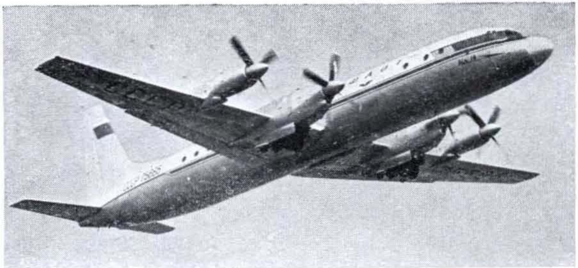
Nationality: British. **Type:** Long- and Medium-range Commercial Transport. **Power Plants:** Four 2,100 h.p. Bristol Hercules 763 radials. **Accommodation:** 40–74 passengers. **Weights:** Basic equipped, 55,350 lb.; max., 86,000 lb. **Performance:** Max. speed, 355 m.p.h. at 20,000 ft.; max. cruising, 261 m.p.h. at 10,000 ft.; range, 3,330 mls. **Dimensions:** Span, 113 ft.; length, 96 ft. 10 in.; height, 30 ft.; wing area, 1,408 sq. ft.



ILYUSHIN IL-18 MOSKVA (COOT)

Flown for the first time in June 1957, the Il-18 now serves with a number of airlines, mostly in communist states and the newer African republics. The first twenty Il-18s were powered alternately by Ivchenko AI-20 and Kuznetsov NK-4 engines of similar output, but the former is now standard.

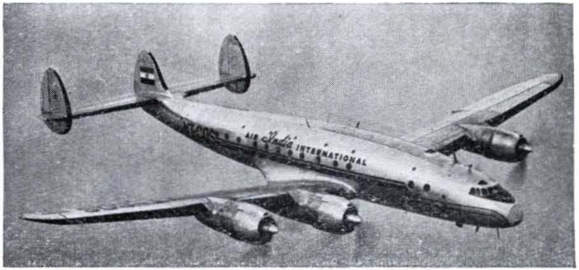
Nationality: Russian. **Type:** Medium-range Commercial Transport. **Power Plants:** Four 4,000 e.h.p. Ivchenko AI-20 turboprops. **Accommodation:** 73–111 passengers. **Weights:** Empty, 61,730 lb.; max. loaded, 134,480 lb. **Performance:** Max. cruising speed, 404 m.p.h. at 26,250 ft.; range (with 30,865-lb. payload), 1,865 mls. at 388 m.p.h. at 26,250 ft.; range (max. fuel), 3,100 mls. **Dimensions:** Span, 122 ft. 8½ in.; length, 117 ft. 1½ in.; height, 33 ft. 9½ in.; wing area, 1,506·95 sq. ft.

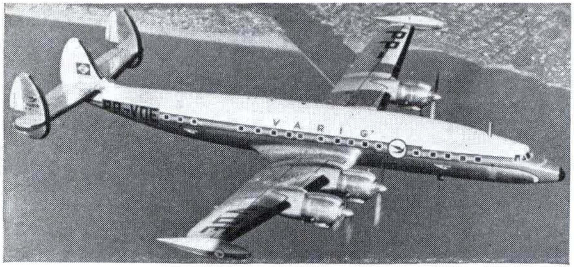


LOCKHEED L.749 CONSTELLATION

Although designed as a commercial transport, the Constellation first flew as the C-69 military transport, twenty of these being delivered. The commercial L.049 was built from components of C-69s cancelled on V-J Day and the L.149 had long-range outer wings. The L.649A was the first built throughout as a commercial type, and the L.749 was a long-range version.

Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 2,500 h.p. Wright Cyclone GR-3350-BD1 radials. **Accommodation:** 44–64 passengers. **Weight:** Max. loaded, 102,000 lb. **Performance:** Max. speed, 350 m.p.h.; max. cruising, 328 m.p.h.; normal range, 3,000 mls. **Dimensions:** Span, 123 ft.; length, 95 ft. 1¼ in.; height, 23 ft.; wing area, 1,650 sq. ft.

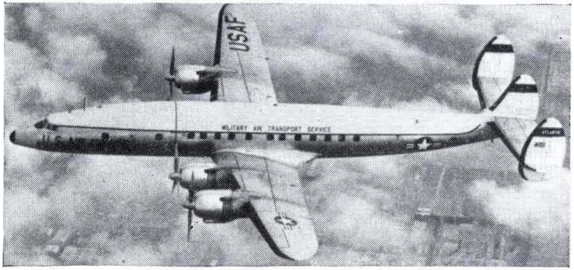




LOCKHEED L.1049G SUPER CONSTELLATION

A lengthened, more powerful development of the L.749, the L.1049 flew on October 13, 1950. The L.1049A has 2,800 h.p. Wright Cyclones; the L.1049C has Turbo Compound engines and an increase in max. weight from 120,000 lb. to 133,000 lb.; the L.1049D is a freighter; the L.1049E has a max. loaded weight of 135,400 lb., and the L.1049G (illustrated) can be fitted with auxiliary wingtip tanks.

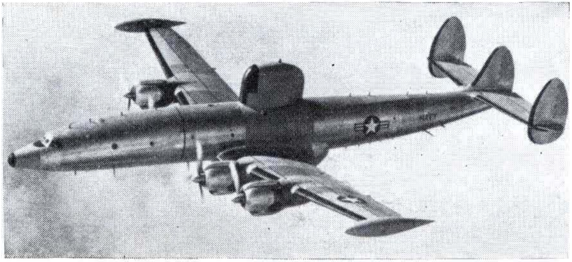
Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 3,250 h.p. Wright R-3350-DA3 radials. **Accommodation:** 63–99 passengers. **Weight:** Max. loaded, 137,500 lb. **Performance:** Max. speed, 370 m.p.h. at 20,000 ft.; cruising, 355 m.p.h. **Dimensions:** Span, 123 ft.; length, 113 ft. 7 in.; height, 24 ft. 9 in.; wing area, 1,650 sq. ft.



LOCKHEED C-121C

Several versions of the L.749 and L.1049 Constellation and Super Constellation have been supplied to the U.S.A.F. and the U.S. Navy. Nine L.749s were supplied to the U.S.A.F., eight of these being PC-121A personnel and freight transports and one being a VC-121B V.I.P. transport, these being followed by some thirty conversions of L.1049Fs as C-121C. The U.S. Navy version of the L.1049B is designated R7V-1.

Nationality: American. **Type:** Long-range Military Transport. **Power Plants:** Four 3,250 h.p. Wright R-3350-34 Turbo Compound radials. **Weights:** Empty, 73,133 lb.; max. loaded, 135,400 lb. **Performance:** Max. speed, 376 m.p.h.; max. cruising, 331 m.p.h. at 23,000 ft. **Dimensions:** Span, 123 ft. 5 in.; length, 116 ft. 2 in.; height, 24 ft. 9 in.; wing area, 1,654 sq. ft.



LOCKHEED WV-2 (EC-121D)

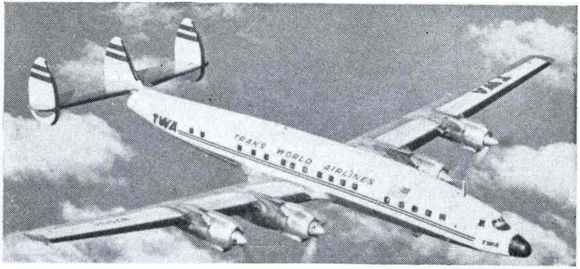
Developed for high-altitude, radar picket duties from the L.1049 Super Constellation, the U.S. Navy's WV-2 carries some five-and-a-half tons of radar and electronic equipment, and a crew of up to thirty-one members. U.S.A.F. versions include the EC-121C and the EC-121D, ten and forty examples of which were delivered respectively, the latter having increased fuel capacity. The WV-3 is a weather reconnaissance version.

Nationality: American. **Type:** Long-range Radar Picket. **Power Plants:** Four 3,500 h.p. Wright R-3350-34 Turbo Compound radials. **Weight:** Loaded, 140,000 lb. **Performance:** Patrol speed, 240 m.p.h.; endurance, 18 hrs. **Dimensions:** Span, 123 ft. 5 in.; length, 116 ft. 2 in.; height, 27 ft.; wing area, 1,654 sq. ft.

LOCKHEED L.1649A STARLINER

Although derived from the L.1049 Super Constellation, the L.1649A Starliner possesses an entirely new wing of thinner section, and the engines are mounted five feet further from the cabin. Forty-three were built and forty-two serve with Air France, Lufthansa and T.W.A. Some are being converted to all-cargo configuration with cargo doors and heavy-duty floors.

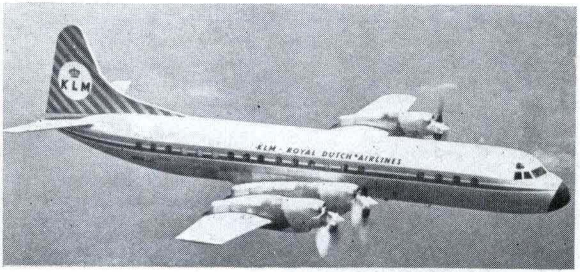
Nationality: American. **Type:** Long-range Commercial Transport. **Power Plants:** Four 3,400 h.p. Wright 988TC18EA2 Turbo Compound radials. **Accommodation:** 58–92 passengers. **Weight:** Max. loaded, 156,000 lb. **Performance:** Max. speed, 377 m.p.h. at 18,600 ft.; max. cruising, 342 m.p.h. at 22,600 ft. **Dimensions:** Span, 150 ft.; length, 116 ft. 2 in.; height, 23 ft. 5 in.; wing area, 1,850 sq. ft.



LOCKHEED L.188C ELECTRA

The L.188 Electra flew on December 6, 1957, and the initial production model, the L.188A, has a loaded weight of 113,000 lb. The L.188C, or international model, has extra tankage and a gross weight of 116,000 lb. The Electra suffered serious troubles during its early service life, and extensive modifications were made.

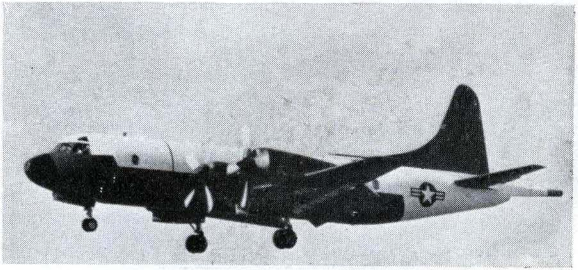
Nationality: American. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Four 3,750 e.h.p. Allison 501-D13 turboprops. **Accommodation:** 66–99 passengers. **Weights:** Empty, 57,000 lb.; max. loaded, 116,000 lb. **Performance:** Max. speed, 448 m.p.h. at 12,000 ft.; cruising (at 85,500 lb.), 405 m.p.h. at 22,000 ft.; range (max. payload), 3,450 mls. **Dimensions:** Span, 99 ft.; length, 104 ft. 6½ in.; height, 32 ft. 11¼ in.; wing area, 1,300 sq. ft.

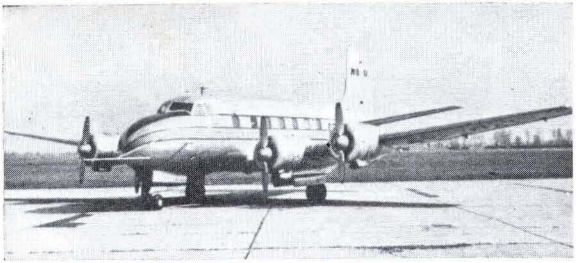


LOCKHEED P3V-1 ORION

Derived from the commercial Electra transport, the P3V-1 is intended to supplant the P2V-7 in U.S. Navy service. The prototype, the Y/P3V-1, flew for the first time on November 25, 1959, and production deliveries commenced in 1961. The Orion can search 370,000 sq. miles during a single mission.

Nationality: American. **Type:** Long-range Maritime Reconnaissance Aircraft. **Power Plants:** Four 4,585 e.h.p. (wet) Allison T56-A-10W turboprops. **Armament:** Conventional and nuclear torpedoes and depth charges. **Weight:** Loaded, 125,000 lb. **Performance:** Approx. max. speed, 460 m.p.h. at 24,000 ft.; max. cruising, 380–390 m.p.h.; patrol speed 220–240 m.p.h. at sea level; approx. patrol endurance, 8 hrs. **Dimensions:** Span, 99 ft.; length, 113 ft. 7 in.; height, 33 ft. 1 in.; wing area, 1,300 sq. ft.

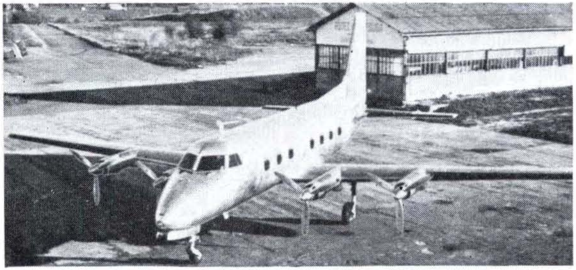




O.K.L. MD-12

Flown for the first time in August 1959, the MD-12 feederliner has been built at the Warsaw-Okecie Works of the O.K.L. (Aviation Construction Centre). Originally to have been of twin-engined design, the MD-12 has been designed to replace DC-3s on the internal routes operated by L.O.T. A freighter version featuring two loading doors is proposed, this variant carrying up to 4,200 lb. of freight.

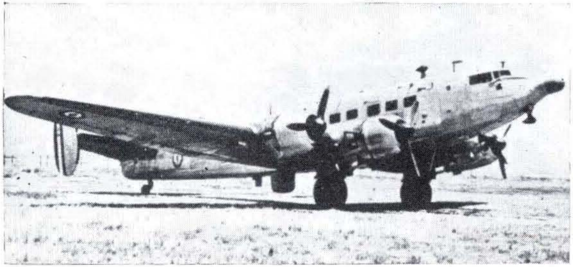
Nationality: Polish. **Type:** Short-range Transport. **Power Plants:** Four 340 h.p. Narkiewicz WN-3 radials. **Accommodation:** 20 passengers. **Weights:** Empty, 10,913 lb.; loaded, 16,535 lb. **Performance:** Max speed, 205 m.p.h. at sea level; cruising, 177 m.p.h. at 8,200 ft. **Dimensions:** Span, 69 ft. 10½ in.; length, 51 ft. 8½ in.; height, 19 ft.; wing area, 592 sq. ft.



POTEZ P.840

Design of the P.840 feederliner was initiated in May 1959, and the first prototype was flown on April 29, 1961. A second prototype is currently under construction, and several versions of the P.840 are projected. The initial model will offer a variety of seating arrangements for up to twenty-four passengers.

Nationality: French. **Type:** Short-range Commercial Transport. **Power Plants:** Four 442 e.h.p. Turboméca Astazou turboprops. **Accommodation:** 16–24 passengers. **Weights:** Empty, 8,900 lb.; loaded, 15,390 lb. **Performance:** Max. speed, 322 m.p.h. at 19,700 ft.; cruising, 315 m.p.h.; initial climb, 2,125 ft./min.; service ceiling, 37,100 ft.; max. range, 930 mls. **Dimensions:** Span, 63 ft. 8 in.; length, 50 ft. 4 in.; height, 17 ft.; wing area, 376 sq. ft.



SUD-EST SE-161 LANGUEDOC

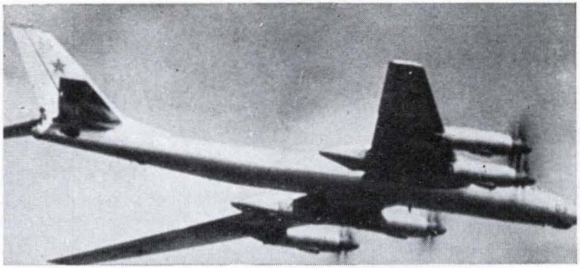
Of pre-war design, having been flown for the first time in 1939, the Languedoc was manufactured by the former Sud-Est concern after the war. Most Languedocs have now been retired, but it still serves as a crew trainer at the French Navy's 56S training squadron, and five are used by Aviaco.

Nationality: French. **Type:** Commercial Transport and Military Crew Trainer. **Power Plants:** Four 1,200 h.p. Pratt and Whitney R-1830-92 Twin Wasp radials. **Weights:** Empty, 27,890 lb.; loaded, 45,364 lb. **Performance:** Max. speed, 273 m.p.h. at sea level; cruising, 233 m.p.h. at 7,548 ft.; normal range, 1,678 mls.; range (max. fuel), 1,988 mls. **Dimensions:** Span, 96 ft. 5 in.; length, 79 ft. 7 in.; height, 16 ft. 10 in.; wing area, 1,197·8 sq. ft.

TUPOLEV TU-20 (BEAR)

Sharing with the Myasishchev Bison the rôle of standard strategic heavy bomber of the *Dalnaya Aviatsiya*, the Tu-20 is the only turboprop-driven heavy bomber in the world, and has now been in service for some six years. It is also used for long-range maritime reconnaissance duties.

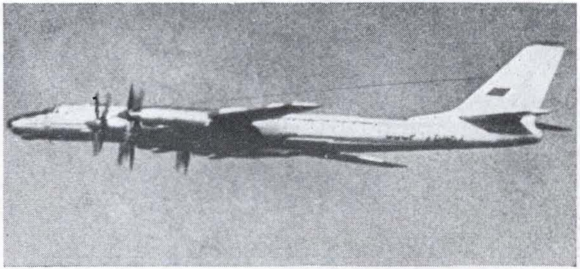
Nationality: Russian. **Type:** Long-range Heavy Bomber. **Power Plants:** Four 12,000 s.h.p. Kuznetsov NK-12 turboprops. **Armament:** Max. bomb load of 20,000 lb. Twin 23-mm. cannon in dorsal, ventral and tail positions, and one fixed 23-mm. cannon. **Weight:** Max loaded, 320,000 lb. **Performance:** Approx. max. speed, 580 m.p.h. at 10,000 ft.; cruising, 520–560 m.p.h. at 36,000 ft.; range (max fuel), 7,500 mls. **Dimensions:** Span, 212 ft.; length, 170 ft.; height, 40 ft.; wing area, 3,347 sq. ft.



TUPOLEV TU-114D (CLEAT)

The Tu-114D is a straightforward transport conversion of the Tu-20 bomber intended to carry a small number of passengers and urgent freight over very long distances at high speeds. In 1958–60, the Tu-114D established a number of international records. The prototype flew from Moscow to Irkutsk and back non-stop at an average speed of 497 m.p.h. in the Spring of 1958, and on March 24, 1960, a Tu-114D was flown over a 1,000-km. closed-circuit with a 55,116-lb. payload at 541 m.p.h.

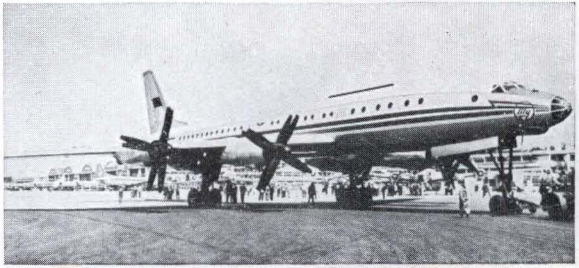
Nationality: Russian. **Type:** Long-range Commercial Transport. **Power Plants:** Four 12,000 s.h.p. Kuznetsov NK-12M turboprops. **Weight:** Loaded, 268,800 lb. **Performance:** Approx. max. speed, 560 m.p.h. at 10,000 ft.; max. cruising, 500 m.p.h. **Dimensions:** Similar to those of Tu-20.

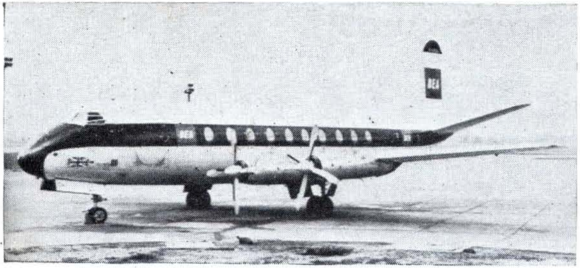


TUPOLEV TU-114 (CLEAT)

The largest commercial transport in the world at the present time, the Tu-114 first flew in the Autumn of 1957, and is currently entering service on Aeroflot routes. The Tu-114 employs the wings, undercarriage and much of the tail assembly of the Tu-20 bomber, and the engines are derated versions of those employed by this aircraft.

Nationality: Russian. **Type:** Long-range Commercial Transport. **Power Plants:** Four 8,000–9,000 s.h.p. Kuznetsov NK-12M turboprops. **Accommodation:** 170–220 passengers. **Weights:** Normal loaded, 370,000 lb.; max., 400,000 + lb. **Performance:** Max. cruising speed, 495 m.p.h. at 32,800 ft.; normal range cruising, 450 m.p.h. at 30,000 ft. **Dimensions:** Span, 212 ft.; length, 177 ft.; height, 43 ft.; wing area ,3,347 sq. ft.

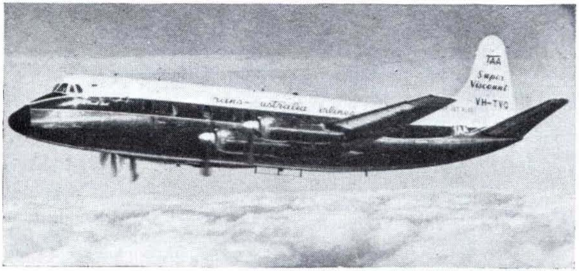




VICKERS VISCOUNT 700 SRS.

The Viscount 700 was the original version of this widely-used transport, the first production model being the Viscount 701 for B.E.A. (illustrated). The Viscount 700D has the same airframe, but 1,670 e.h.p. Dart 510s supplant the Dart 506s, and the 770D is the basic North American version. Two hundred and eighty-five 700 Srs. Viscounts have been built.

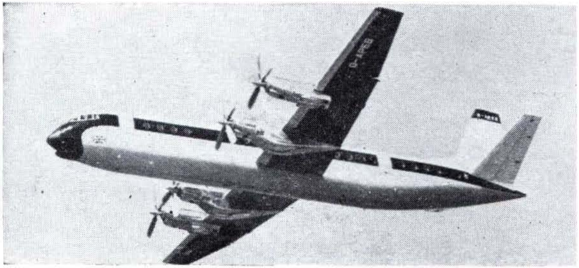
Nationality: British. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Four 1,480 e.h.p. Rolls-Royce Dart 506 turboprops. **Accommodation:** 40–59 passengers. **Weights:** Empty, 35,500 lb.; max. loaded, 58,500 lb. **Performance:** Max. cruising speed, 323 m.p.h. at 25,000 ft.; ceiling, 28,500 ft. **Dimensions:** Span, 93 ft. 8½ in.; length, 81 ft. 9 in.; height, 27 ft. 9 in.; wing area, 963 sq. ft.



VICKERS VISCOUNT 810 SRS.

The Viscount 800 is a " stretched " version of the 700 Srs. transport particularly suited for high-density short-haul routes. All Srs. 800 models have Dart 510s with the exception of the Viscount 806 for B.E.A. which has 1,815 e.h.p. Dart 520s. The Viscount 810 and 840 Series are externally similar but have 1,990 e.h.p. Dart 525s and 2,350 e.h.p. Dart 541s respectively.

Nationality: British. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Four 1,990 e.h.p. Rolls-Royce Dart 525 turboprops. **Accommodation:** 52–75 passengers. **Weights:** Empty, 41,276 lb.; max. loaded, 72,500 lb. **Performance:** Max. cruising speed, 357 m.p.h.; econ. cruising, 356 m.p.h. **Dimensions:** Span, 93 ft. 8½ in.; length, 85 ft. 8 in.; height, 26 ft. 9 in.; wing area, 963 sq. ft.



VICKERS VANGUARD 950 SRS.

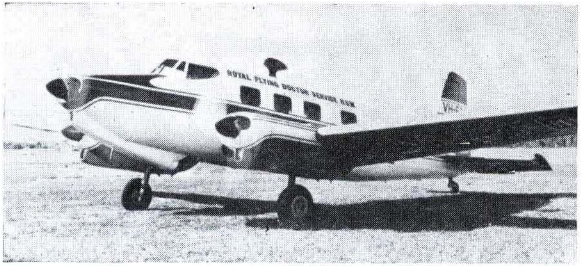
The Vanguard entered regular service with B.E.A. in 1961, the first of six Vanguard 951s for B.E.A. having flown on April 22, 1959. The Vanguard 952s for T.C.A. have Tyne 512s in place of the 4,985 e.h.p. Tyne 506s, and the following specification applies to this type.

Nationality: British. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Four 5,545 e.h.p. Rolls-Royce Tyne 512 turboprops. **Accommodation:** 76–139 passengers. **Weights:** Basic operational, 85,500 lb.; max. loaded, 146,500 lb. **Performance:** Max. cruising speed, 450 m.p.h.; range (max. fuel), 3,130 mls. at 410 m.p.h., (max. payload), 1,830 mls. **Dimensions:** Span, 118 ft.; length, 122 ft. 10⅜ in.; height, 34 ft. 11 in.; wing area, 1,529 sq. ft.

DE HAVILLAND DHA-3 DROVER 3

The Drover flew for the first time on January 23, 1948, and twenty had been built when production terminated in 1953. The Drover was originally powered by 145 h.p. de Havilland Gipsy Major 10 Mk. 2 engines, and seven are still flying with these. Six have been re-engined with Lycomings for the Royal Flying Doctor Service, and this variant is illustrated and described.

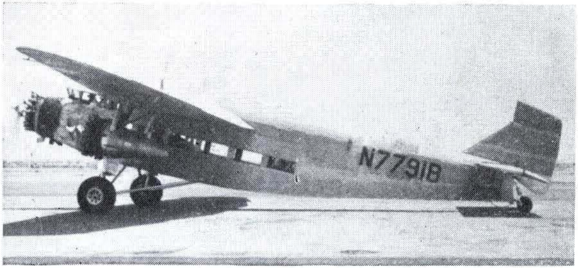
Nationality: Australian. **Type:** Light Commercial Utility Transport. **Power Plants:** Three 180 h.p. Lycoming O-360-A1A engines. **Weights:** Empty, 4,600 lb.; loaded, 6,500 lb. **Performance:** Cruising speed, 140 m.p.h. at 8,000 ft.; initial climb, 1,000 ft./min.; max. ceiling, 20,000 ft.; range (132 Imp. gal.), 900 mls. **Dimensions:** Span, 57 ft.; length, 36 ft. 3 in.; height, 10 ft. 9 in.; wing area, 325 sq. ft.



FORD 5-AT-B

A number of Ford 5-AT-B transports of 1928-vintage are still flying in the U.S.A. and Latin America. The Ford 5-AT-B is externally similar to the Ford 4-AT-E, several examples of which are also flying, but has a greater wing span and increased weights. A total of 199 Ford Trimotors was built by the Stout Metal Airplane Company, and the example of the Ford 5-AT-B illustrated was re-engined in 1958 with 450 h.p. Pratt and Whitney R-985 Wasp Juniors.

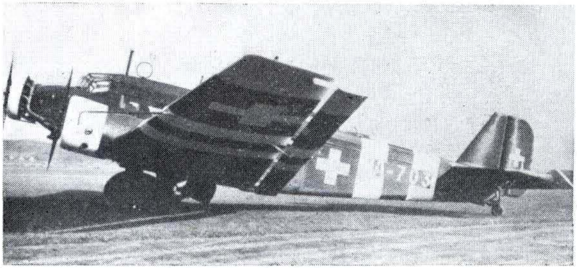
Nationality: American. **Type:** Commercial Freighter. **Power Plants:** Three 420 h.p. Pratt and Whitney Wasp radials. **Weights:** Empty, 7,500 lb.; loaded, 13,250 lb. **Performance:** Max. speed, 152 m.p.h. **Dimensions:** Span, 77 ft. 10 in.; length, 49 ft. 10 in.; wing area, 835 sq. ft.

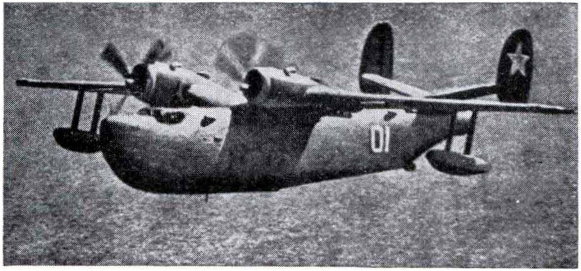


JUNKERS JU 52/3M

At least eight Ju 52/3M transports are still in airline service and that illustrated is operated by the Swiss Air Force for miscellaneous tasks. A total of 3,234 transports of this type was built, 2,804 of them during the war years. The Ju 52/3M g7e has been built under licence in Spain with 750 h.p. Elizalde-built BMW 132 engines and serves with the Spanish Air Force as the CASA-352-L, and others were built in France under the designation A.A.C.1, subsequently being used by the Armée de l'Air.

Nationality: German. **Type:** Commercial and Military Transport. **Power Plants:** Three 830 h.p. BMW 132A radials. **Weights:** Empty, 14,325 lb.; loaded, 24,200 lb. **Performance:** Max. speed, 165 m.p.h.; cruising, 132 m.p.h.; range, 800 mls. **Dimensions:** Span, 95 ft. 10 in.; length, 62 ft.; height, 14 ft.

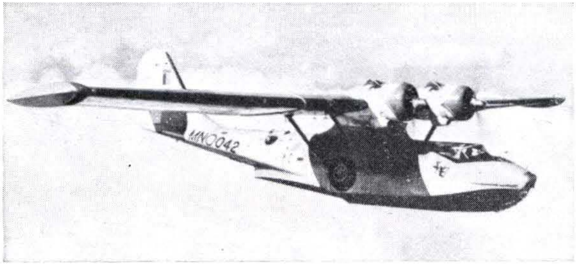




BERIEV BE-6 (MADGE)

Now largely relegated to fishery patrol and protection duties but still serving in small numbers with the Soviet Navy, the Be-6 is the only Russian flying boat of post-war design to have attained quantity production. Designed by G. M. Beriev, the Be-6 maritime reconnaissance flying boat was placed in production in 1949, entering service in 1950–1.

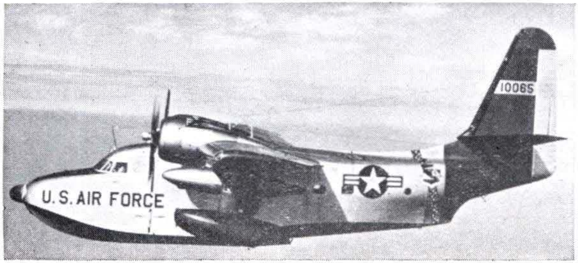
Nationality: Russian. **Type:** Reconnaissance and Patrol Flying Boat. **Power Plants:** Two 2,000 h.p. Shvetsov ASh-73 radials. **Armament:** Three 23-mm. cannon in manned and remotely-controlled turrets, and mines, depth charges or torpedoes underwing. **Weight:** Loaded, 51,588 lb. **Performance:** Max. speed, 258 m.p.h. at 7,875 ft.; max. range, 3,045 mls. **Dimensions:** Span, 108 ft. 3¼ in.; length, 73 ft. 10 in.; height, 24 ft. 7 in.



CONVAIR PBY-5A CATALINA (CANSO)

The PBY-5A serves in small numbers with many of the world's air forces, and some fifty are currently in airline service, many others being employed for miscellaneous civil duties. An amphibious development of the PBY-5 flying boat, the PBY-5A was built in large numbers in the U.S.A. and Canada during the war years, some 2,140 (including PBY-6A, PB2B-1, PBV-1, and PBN-1 versions), 676 being built in Canada.

Nationality: American. **Type:** General-purpose Amphibian Flying Boat. **Power Plants:** Two 1,200 h.p. Pratt and Whitney R-1830-92 radials. **Weights:** Empty, 17,564 lb.; loaded, 34,000 lb. **Performance:** Max. speed, 196 m.p.h. at 7,500 ft.; cruising, 130 m.p.h.; range, 2,520 mls. **Dimensions:** Span 104 ft.; length, 63 ft. 10 in.; height, 18 ft. 10 in.; wing area, 1,400 sq. ft.



GRUMMAN SA-16B (UF-2) ALBATROSS

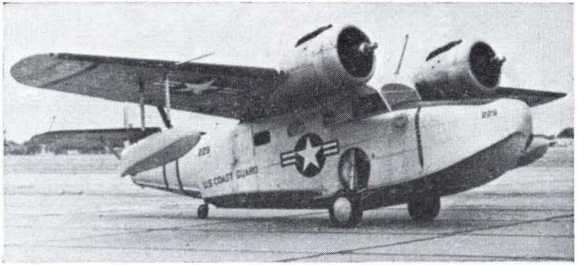
The Grumman G-111 is a modified version of the original G-64 Albatross with numerous modifications to improve performance. It serves with the U.S.A.F. as the SA-16B and with the U.S. Navy as the UF-2. A specially modified version of the SA-16B for the R.C.A.F., designated CSR-110, is illustrated on page 13. The U.S. Coast Guard version is designated UF-2G.

Nationality: American. **Type:** General-purpose Military Amphibian Flying Boat. **Power Plants:** Two 1,425 h.p. Wright R-1820-76A radials. **Weights:** Empty, 22,883 lb.; loaded, 30,353 lb.; max., 37,500 lb. **Performance:** Max. speed, 237 m.p.h.; max. cruising, 204 m.p.h.; initial climb, 1,450 ft./min.; range, 2,850 mls. **Dimensions:** Span, 96 ft. 8 in.; length, 62 ft. 10 in.; height, 25 ft. 10 in.; wing area, 1,035 sq. ft.

GRUMMAN G-21 GOOSE

First flown in June 1937, the Goose serves with several air forces and navies for coastal patrol and rescue duties. Most aircraft of this type currently in service are of the JRF-5 and -6 versions, and the JRF-5G of the U.S. Coast Guard is illustrated. A considerable number of civil G-21As are also active.

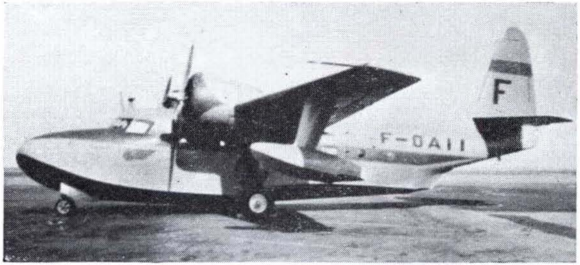
Nationality: American. **Type:** Civil and Military Utility Amphibian Flying Boat. **Power Plants:** Two 450 h.p. Pratt and Whitney R-985-AN-6 radials. **Weights:** Empty, 5,425 lb.; loaded, 8,500 lb. **Performance:** Max. speed, 201 m.p.h. at 5,000 ft.; cruising, 191 m.p.h. at 5,000 ft.; initial climb, 1,100 ft./min.; service ceiling, 21,000 ft.; max. range, 640 mls. at econ. cruising. **Dimensions:** Span, 49 ft.; length, 38 ft. 4 in.; height, 15 ft.; wing area, 375 sq. ft.



GRUMMAN G-73 MALLARD

The ten-seat Mallard commercial amphibian was Grumman's first post-war flying boat, and deliveries of this type to civil operators commenced in 1947, production terminating with the sixty-first Mallard in 1951. Fifty-three Mallards are currently in service with various civil operators.

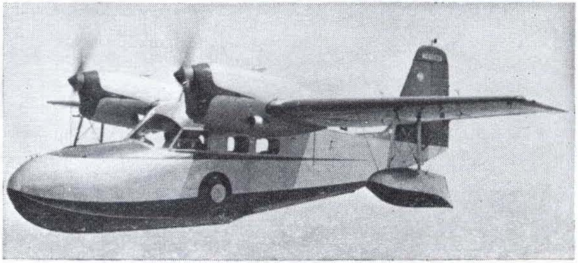
Nationality: American. **Type:** Commercial Transport Amphibian Flying Boat. **Power Plants:** Two 600 h.p. Pratt and Whitney R-1340-S3H1 radials. **Accommodation:** Ten passengers. **Weights:** Empty, 9,350 lb.; loaded, 12,750 lb. **Performance:** Max. speed, 215 m.p.h. at 6,000 ft.; cruising, 180 m.p.h. at 8,000 ft.; initial climb, 1,290 ft./min.; range (1,950-lb. payload), 730 mls. **Dimensions:** Span 66 ft. 8 in.; length, 48 ft. 4 in.; height, 18 ft. 9 in.; wing area, 444 sq. ft.

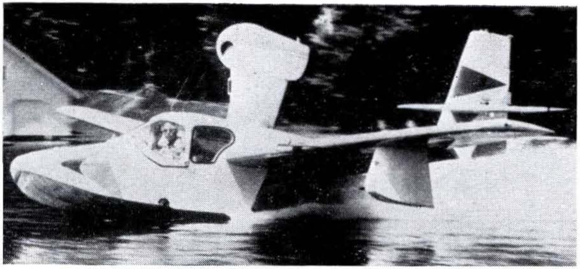


GRUMMAN G-44 WIDGEON

First flown in July 1940, the G-44 Widgeon was built in small numbers during the war years as a light utility and patrol amphibian, production continuing after the war with the commercial G-44A, some fifty commercial models being built. Forty were built by the Société de Constructions Aéro-Navales as the SCAN-30. Fifteen of these have been converted to take 300 h.p. Lycoming R-680-E3 radials in the U.S.A. as the Pace Gannet. Others have been converted to take 260 h.p. Lycoming GO-435-As.

Nationality: American. **Type:** Commercial Amphibian Flying Boat. **Power Plants:** Two 200 h.p. Range 6-440C-5 engines. **Weight:** Loaded, 4,525 lb. **Performance:** Max. speed, 160 m.p.h. **Dimensions:** Span, 40 ft.; length, 31 ft. 1 in.; height, 11 ft. 5 in.; wing area, 245 sq. ft.

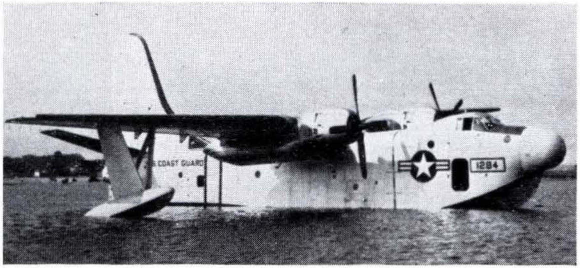




LAKE MODEL C-2 SKIMMER IV

Originally known as the Colonial C-2 Skimmer, the first Lake-built Skimmer IV flew in the Spring of 1960, and a number of aircraft of this type have now been delivered. The Skimmer is believed to be the only single-engined amphibian flying boat currently in production, apart from the FN-333 Riviera.

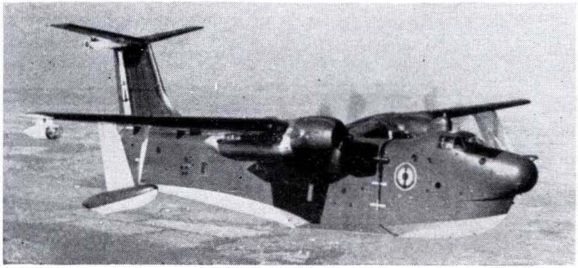
Nationality: American. **Type:** Four-seat Light Amphibian Flying Boat. **Power Plant:** One 180 h.p. Lycoming O-360-A1A engine. **Weights:** Empty, 1,575 lb.; loaded, 2,400 lb. **Performance:** Normal cruising speed, 131 m.p.h. at 6,000 ft.; initial climb, 800 ft./min.; service ceiling, 14,000 ft.; max. range at econ. cruising, 627 mls.; range at 131 m.p.h. at 6,000 ft., 500 mls. **Dimensions:** Span, 38 ft.; length, 24 ft. 11 in.; height, 9 ft. 4 in.; wing area, 170 sq. ft.



MARTIN P5M-1 MARLIN

The P5M-1 Marlin was designed to replace the PBM-5 Mariner, and the first aircraft flew on June 22, 1951. Production of the P5M-1 continued until 1954, and a number of aircraft were delivered to the U.S. Coast Guard as the P5M-1G for search and rescue duties, this version being illustrated. U.S. Navy P5M-1s underwent a modernisation programme in 1957.

Nationality: American. **Type:** Anti-submarine Patrol Flying Boat. **Power Plants:** Two 3,250 h.p. Wright R-3350-36WA Turbo Compound radials. **Armament:** Two 20-mm. cannon in tail and up to 12,000 lb. of torpedoes, bombs, etc. **Weights:** Empty, 47,686 lb.; loaded, 73,488 lb. **Performance:** Max. speed, 246 m.p.h. **Dimensions:** Span, 118 ft. 2¼ in.; length, 94 ft. 11 in.; height, 38 ft. 8½ in.; wing area, 1,406·33 sq. ft.



MARTIN P5M-2 MARLIN

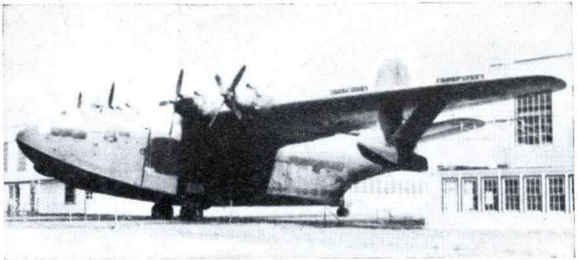
An improved version of the P5M-1, the first P5M-2 flew on April 29, 1954, and production of this flying boat terminated at the end of 1960. Externally, the P5M-2 differs from its predecessor primarily in having a high-mounted tailplane. Ten P5M-2s were supplied to the French Aéronavale and are operated by 27F.

Nationality: American. **Type:** Anti-submarine Patrol Flying Boat. **Power Plants:** Two 3,400 h.p. Wright R-3350-32WA Turbo Compound radials. **Armament:** As for P5M-1. **Weights:** Empty, 50,485 lb.; loaded, 76,635 lb. **Performance:** Max. speed, 251 m.p.h. at sea level; ceiling, 22,400 ft.; range (A.S.W. mission), 2,050 mls., (ferry), 3,100 mls.; patrol speeds, 150–180 m.p.h. **Dimensions:** Span, 118 ft. 2¼ in.; length, 100 ft. 7¼ in.; height, 32 ft. 8½ in.; wing area, 1,406·33 sq. ft.

MARTIN MODEL 170 MARS

Four of the Martin JRM-1 Mars flying boats originally operated by the U.S. Naval Air Transport Service were purchased as surplus by the Forest Industries Flying Tankers Limited, and these have been converted by the Fairey Aviation Company of Canada for use as water tankers for "bombing" forest fires. The Mars can carry 7,000 gallons of water.

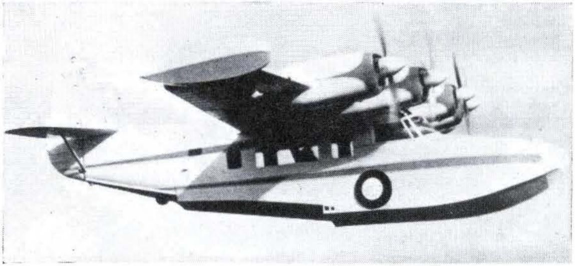
Nationality: American. **Type:** Commercial Water Tanker Flying Boat. **Power Plants:** Four 2,250 h.p. Wright R-3350-8 radials. **Weights:** Approx. empty, 77,000 lb.; loaded, 145,000 lb. **Performance:** Max. speed, 220 m.p.h. at 13,900 ft.; economical cruising, 135 m.p.h.; initial climb, 570 ft./min.; maximum range, 3,315 mls. **Dimensions:** Span, 200 ft.; length, 120 ft. 3 in.; height, 44 ft. 7 in.; wing area, 3,686 sq. ft.



MCKINNON G-21C GOOSE

The McKinnon G-21C is a conversion of the Grumman Goose in which four engines replace the original pair of Pratt and Whitney radials and retractable wingtip floats are introduced. The prototype conversion flew on January 25, 1958, and the first production conversion followed on December 30, 1958. A further development, the G-21D, has a lengthened (by 3 ft.) hull.

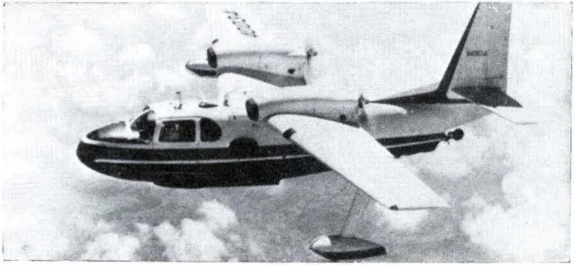
Nationality: American. **Type:** Light Commercial Executive and Utility Amphibian Flying Boat. **Power Plants:** Four 340 h.p. Lycoming GSO-480-B2D6 engines. **Accommodation:** 6–10 passengers. **Weights:** Empty, 8,500 lb.; loaded, 12,499 lb. **Performance:** Max. speed, 264 m.p.h.; max. cruising, 205 m.p.h. at sea level. **Dimensions:** Span, 50 ft. 10 in.; length, 39 ft. 7 in.; height, 14 ft. 6 in.; wing area, 377·64 sq. ft.

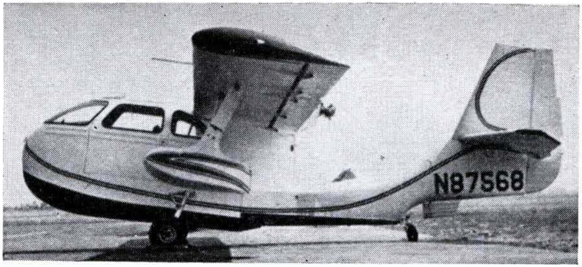


PIAGGIO P.136-L

First flown on August 29, 1948, the P.136 amphibian is currently available in two versions, the P.136-L-1 (270 h.p. Lycoming GO-480-B) and P.136-L-2 (340 h.p. Lycoming GSO-480). These are marketed in the U.S.A. as the Trecker Gull. Some eighty amphibians of this type have been built of which twenty-three have been supplied to the Italian Air Force.

Nationality: Italian. **Type:** Five-seat Amphibian Flying Boat. **Power Plants:** Two 270 h.p. Lycoming GO-480-B engines. **Weights:** Empty, 4,400 lb.; loaded, 5,996 lb. **Performance:** Max. speed, 183 m.p.h. at sea level; cruising, 167 m.p.h. at 9,000 ft.; service ceiling, 19,685 ft.; normal range, 590 mls.; max. range, 1,056 mls. **Dimensions:** Span, 44 ft. 4¾ in.; length, 35 ft. 5 in.; height, 12 ft. 7 in.; wing area, 270·2 sq. ft.

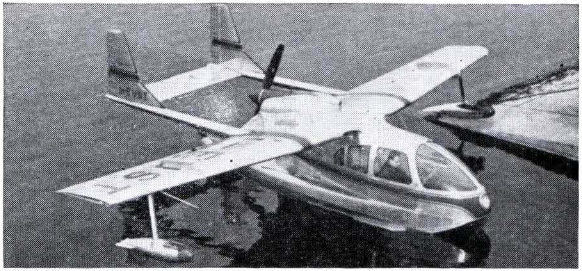




REPUBLIC RC-3 SEABEE

Designed as a simple, low-cost amphibian flying boat, the Seabee was first flown in November 1944, and a total of 1,060 aircraft of this type had been built when production terminated in October 1947. A substantial number of Seabee amphibians are still active, particularly in North, Central and South America.

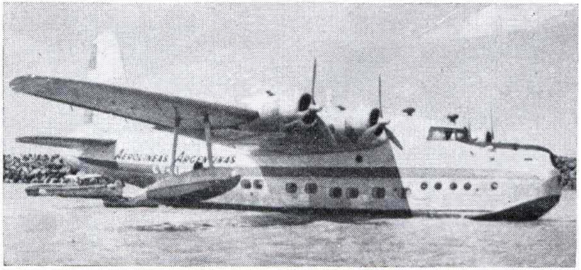
Nationality: American. **Type:** Four-seat Commercial Amphibian Flying Boat. **Power Plant:** One 215 h.p. Franklin 6A8-215-B7F engine. **Weights:** Empty, 1,950 lb.; loaded, 3,000 lb. **Performance:** Max. speed, 120 m.p.h.; cruising speed, 103 m.p.h.; initial climb, 700 ft./min.; service ceiling, 12,000 ft.; range at econ. cruising, 560 mls. **Dimensions:** Span, 37 ft. 8 in.; length, 27 ft. 11 in.; height, 10 ft. 1 in.; wing area, 196 sq. ft.



SIAI-MARCHETTI FN-333 RIVIERA

Originally developed by the Nardi company and flown as a three-seater on December 4, 1952, the FN-333 has since been extensively developed, and in March 1959 the manufacture of the amphibian was transferred from Fiat to SIAI-Marchetti. Two production models are being offered; the Model B with a 275 h.p. Continental IO-470 engine, and the Model C with a 300 h.p. Continental IO-520.

Nationality: Italian. **Type:** Four-seat Commercial Amphibian Flying Boat. **Power Plant:** One 275 h.p. Continental IO-470 engine. **Weights:** Empty, 2,115 lb.; loaded, 3,140 lb. **Performance:** Max. speed, 177 m.p.h. at sea level; cruising speed, 159 m.p.h. at 9,000 ft. **Dimensions:** Span, 34 ft.; length, 20 ft. 8 in.; height, 10 ft. 7 in.; wing area, 163 sq. ft.



SHORT S.25/V SANDRINGHAM

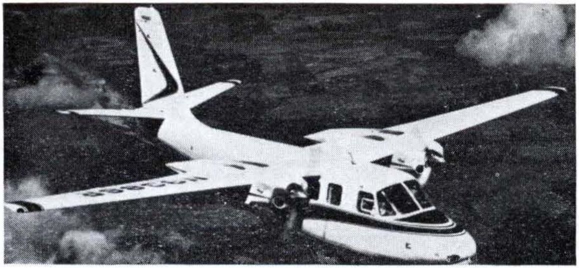
The Sandringham was built as a civil conversion of the Sunderland maritime reconnaissance flying boat, incorporating only secondary structural changes. A total of thirty-three Sandringhams was built and, of these, twelve are currently in service. That illustrated is operated by Aerolineas Argentinas. The last example of the larger Solent was retired at the beginning of 1961.

Nationality: British. **Type:** Long-range Commercial Transport Flying Boat. **Power Plants:** Four 1,200 h.p. Pratt and Whitney R-1830-90C-3 Twin Wasp radials. **Accommodation:** 21–62 passengers. **Weights:** Empty, 41,370 lb.; loaded, 56,000 lb. **Performance:** Max. speed, 238 m.p.h.; max. cruising, 221 m.p.h. **Dimensions:** Span, 112 ft. 9½ in.; length, 86 ft. 3 in.; height, 32 ft. 10½ in.; wing area, 1,487 sq. ft.

AERO COMMANDER 500B

The Commander has been in continuous production since 1951, and approximately 1,000 aircraft have been delivered. All Commanders are essentially similar externally, and four new models were announced in 1960; the Model 500A (260 h.p. Continental IO-470-Ms), 500B (described and illustrated here), 560F (350 h.p. Lycoming IGO-540s), and 680F (360 h.p. Lycoming IGSO-540s).

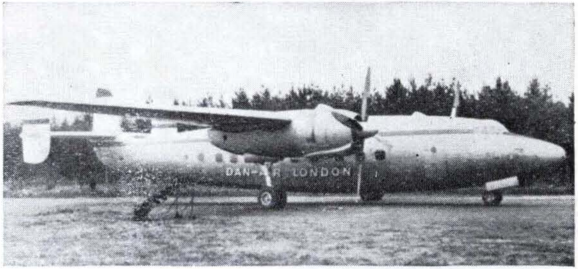
Nationality: American. **Type:** Light Commercial Transport. **Power Plants:** Two 290 h.p. Lycoming IO-540 engines. **Accommodation:** 5–7 passengers. **Weights:** Empty, 4,300 lb.; max. loaded, 6,750 lb. **Performance:** Max. speed, 228 m.p.h. at sea level; cruising, 218 m.p.h. **Dimensions:** Span, 49 ft. 6 in.; length, 35 ft. 1½ in.; height, 14 ft. 6 in.; wing area, 255 sq. ft.



AIRSPEED A.S.57 AMBASSADOR

The Ambassador flew for the first time on July 10, 1947, and twenty production aircraft were built. Two of these are operated by the Royal Jordanian Air Force, and others serve with Dan-Air, Globe Air and B.K.S. The principal feature of the Ambassador's design was its extreme cleanliness.

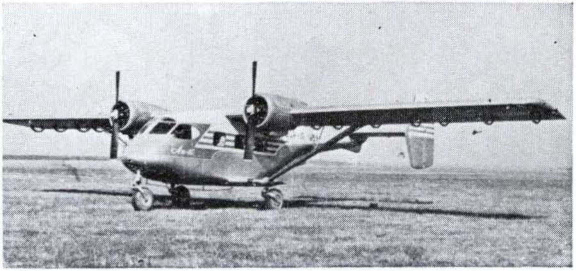
Nationality: British. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Two 2,625 h.p. Bristol Centaurus 661 radials. **Accommodation:** 40–47 passengers. **Weights:** Empty, 36,304 lb.; loaded, 52,500 lb. **Performance:** Max. cruising speed, 312 m.p.h.; normal cruising, 234 m.p.h. at 15,000 ft.; initial climb, 1,250 ft./min.; range (11,650-lb. payload), 740 mls. at 280 m.p.h. **Dimensions:** Span, 115 ft.; length, 82 ft.; height, 18 ft. 3 in.; wing area, 1,200 sq. ft.

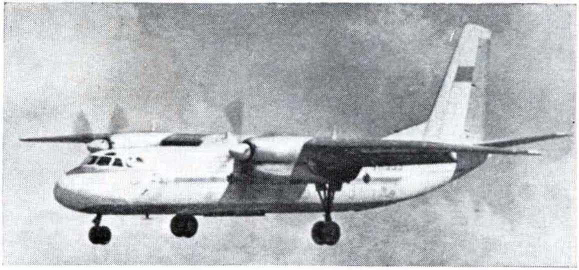


ANTONOV AN-14 PTCHELKA (CLOD)

Designed primarily for operation in Russia's undeveloped areas, the An-14 Ptchelka is a small S.T.O.L. transport, the first of two prototypes of which flew on March 15, 1958. Quantity production was initiated late in 1959. Rear loading doors are fitted and the Ptchelka is suited for agricultural rôles, forestry patrol, pilot and parachute training.

Nationality: Russian. **Type:** Light S.T.O.L. Utility Transport. **Power Plants:** Two 260 h.p. Ivchenko AI-14R radials. **Weights:** Normal loaded, 6,614 lb.; max., 7,055 lb. **Performance:** Max. speed, 143 m.p.h.; cruising, 124 m.p.h.; initial climb, 827 ft./min.; time to 6,500 ft., 10 min.; practical ceiling, 16,405 ft.; max. range, 621 mls. **Dimensions:** Span, 64 ft. 11½ in.; length, 36 ft. 0¼ in.; height, 13 ft. 9¾ in.; wing area, 468 sq. ft.

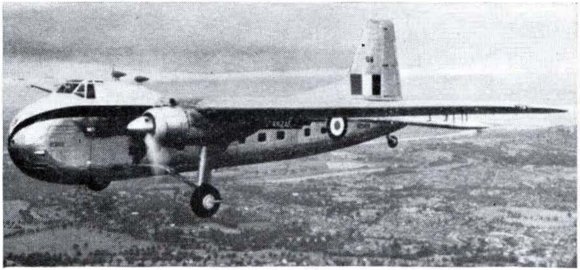




ANTONÓV AN-24

Flown for the first time early in 1960, the An-24 is intended as a replacement for the Il-14 and will, according to Aeroflot, reduce ton-mile costs by twenty-five per cent. In roughly the same category as the Avro 748, the Herald and the Friendship, the An-24 is expected to enter service in 1962. All undercarriage members are twin-wheel units, and the An-24 is intended to operate from relatively small airfields.

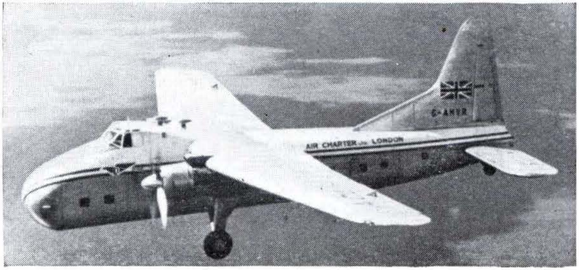
Nationality: Russian. **Type:** Short- and Medium-haul Commercial Transport. **Power Plants:** Two 2,000 s.h.p. Ivchenko turboprops. **Accommodation:** 32–40 passengers. **Weights:** Not available. **Performance:** Cruising speed, 325 m.p.h. at 20,000 ft.; max. range, 1,120 mls. **Dimensions:** No details available for publication.



BRISTOL TYPE 170 MK. 31

Designed as a military transport and currently serving with the R.A.A.F., the R.N.Z.A.F., the R.C.A.F., and the air forces of Argentina, Burma, Iraq and Pakistan, the Type 170 has also been supplied to various civil operators, and of the 214 built some sixty-four are currently in airline service. The Mk. 31E Wayfarer is an all-passenger or cargo/passenger variant.

Nationality: British. **Type:** Military and Commercial Transport. **Power Plants:** Two 1,980 h.p. Bristol Hercules 734 radials. **Weights:** Empty, 25,547 lb.; loaded, 44,000 lb. **Performance:** Max. cruising speed, 193 m.p.h. at 10,000 ft.; initial climb, 1,380 ft./min.; service ceiling, 24,500 ft.; range (with 12,000-lb. payload), 420 mls. **Dimensions:** Span, 108 ft.; length, 68 ft. 4 in.; height, 21 ft. 6 in.; wing area, 1,487 sq. ft.



BRISTOL TYPE 170 MK. 32

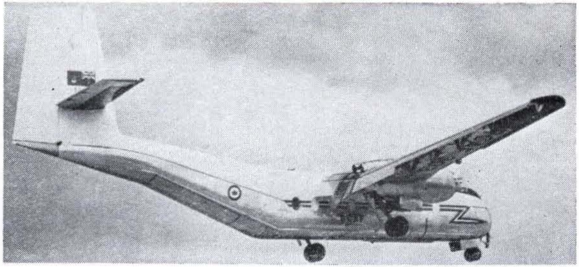
The Type 170 Mk. 32 built for Silver City Airways and Air Charter Limited differs from the Mk. 31 principally in having a lengthened fuselage forward of the wings. This extension permits three standard sized cars to be carried in addition to twenty-three passengers. The first Mk. 32 flew on January 16, 1953. This version is operated exclusively by commercial firms.

Nationality: British. **Type:** Commercial Passenger and Freight Transport. **Power Plants:** Two 1,980 h.p. Bristol Hercules 734 radials. **Weights:** Empty, 29,554 lb.; loaded, 44,000 lb. **Performance:** Max. speed, 225 m.p.h. at 3,000 ft.; cruising, 164 m.p.h. at 5,000 ft.; service ceiling (at 38,000 lb.), 23,000 ft.; range (12,000-lb. payload), 820 mls. **Dimensions:** Span, 108 ft.; length, 73 ft. 8 in.; height, 21 ft. 6 in.; wing area, 1,487 sq. ft.

DE HAVILLAND DHC-4 CARIBOU

First flown on July 30, 1958, the Caribou has been adopted by the U.S. Army which has ordered sixty-one machines under the designation AC-1, and by the Ghanaian Air Force which has ordered eight. As the CC-108, four Caribous are serving with U.N.O. forces operated by R.C.A.F. crews. The AC-1 version can carry twenty-four troops or three tons of freight.

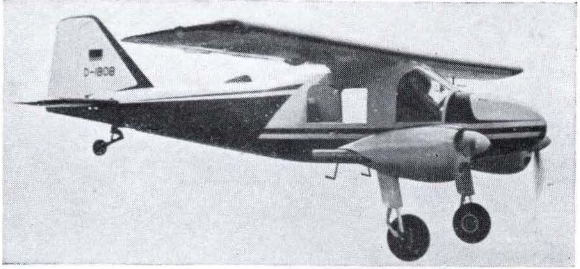
Nationality: Canadian. **Type:** Military Utility Transport. **Power Plants:** Two 1,450 h.p. Pratt and Whitney R-2000-13 radials. **Weights:** Empty, 16,850 lb.; max. loaded, 26,000 lb. **Performance:** Max. speed, 214 m.p.h.; max. cruising, 182 m.p.h. at 7,500 ft.; service ceiling, 27,700 ft.; range (5,685-lb. payload), 400 mls. **Dimensions:** Span, 96 ft. 0½ in.; length, 72 ft. 7 in.; height, 31 ft. 9 in.; wing area, 912 sq. ft.



DORNIER DO 28

Derived from the single-engined Do 27, the Do 28 first flew on April 29, 1959. The design was subsequently refined, and a second prototype representative of the production model flew on March 20, 1960, the first production deliveries being made early in 1961 to the Deutsche Taxiflug G.m.b.H.

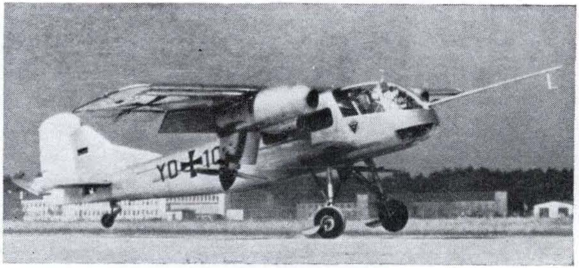
Nationality: German. **Type:** Six-seat Light Commercial Transport. **Power Plants:** Two 255 h.p. Lycoming O-540-A1A engines. **Weights:** Empty, 3,610 lb.; max. loaded, 5,130 lb. **Performance:** Max. speed, 171 m.p.h. at sea level; cruising (75% power), 162 m.p.h. at 6,000 ft., (60% power), 152 m.p.h.; range (75% power), 745 mls., (60% power), 660 mls.; service ceiling (at 4,970 lb.), 20,500 ft. **Dimensions:** Span, 46 ft. 4¾ in.; length, 20 ft. 7¼ in.; height, 10 ft. 4¾ in.; wing area, 262·3 sq. ft.

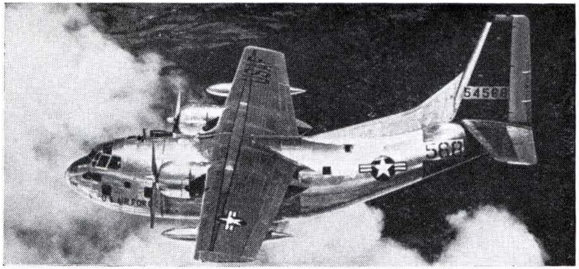


DORNIER DO 29

Built to meet the requirements of an officially-sponsored research programme into various V.T.O.L./S.T.O.L. problems, the Do 29 flew for the first time in December 1958, and three aircraft of this type have been built. The airscrew shafts of the Do 29 rotate downward to provide a thrust vector in a lifting direction, thus reducing take-off and landing distances. The single-seat cockpit is provided with a Martin-Baker ejector seat, and the basic airframe is that of the single-engined Do 27.

Nationality: German. **Type:** S.T.O.L. Research Aircraft. **Power Plants:** Two 275 h.p. Lycoming GO-480-B1A6 engines. **Weight:** Loaded, 5,291 lb. **Performance:** No details available. **Dimensions:** Span, 43 ft. 3¼ in.; length, 31 ft. 2 in.; height, 8 ft. 10¼ in.; wing area, 234 sq. ft.

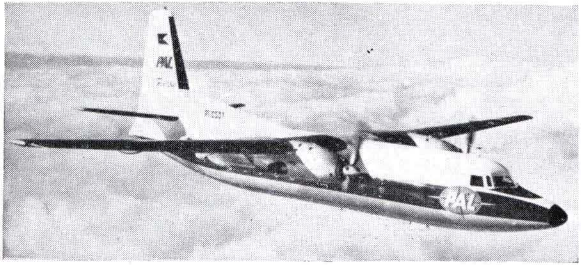




FAIRCHILD C-123B PROVIDER

Serving with the U.S.A.F. and the air forces of Venezuela and Saudi Arabia, the C-123B Provider assault transport was originally designed by the Chase Aircraft Company, but the 300 production machines were built by Fairchild, the first of these flying on September 1, 1954.

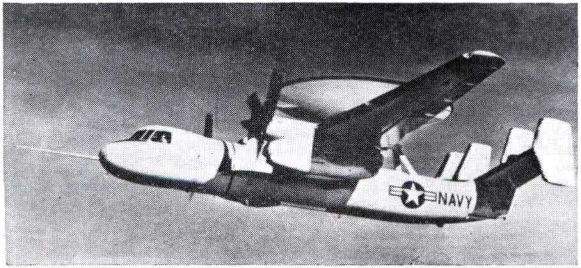
Nationality: American. **Type:** General-purpose and Assault Transport. **Power Plants:** Two 2,500 h.p. Pratt and Whitney R-2800-99W radials. **Weights:** Empty, 31,380 lb.; loaded, 56,500 lb.; max., 60,000 lb. **Performance:** Max. speed, 253 m.p.h.; cruising speed, 186 m.p.h.; range (19,000-lb. payload), 1,340 mls., (12,000-lb. payload), 2,440 mls.; initial climb, 875 ft./min.; service ceiling, 24,000 ft. **Dimensions:** Span, 110 ft.; length, 76 ft. 3 in.; height, 34 ft. 1 in.; wing area, 1,223 sq. ft.



FOKKER F.27 FRIENDSHIP SRS. 200

Friendships powered by the 1,742 e.h.p. Dart 511 and the Dart 528 are respectively designated Series 100 and Series 200 by the parent company and F-27 and F-27A by the Fairchild Company which has manufactured the Friendship in the U.S.A. With a reinforced floor and cargo loading doors, the F.27 is known as the Freightship by Fokker and F-27B by Fairchild.

Nationality: Dutch. **Type:** Short- and Medium-haul Commercial Transport. **Power Plants:** Two 2,100 e.h.p. Rolls-Royce Dart 528 turboprops. **Accommodation:** 32–48 passengers. **Weight:** Max. loaded, 42,000 lb. **Performance:** Cruising speed (at 36,000 lb.), 230 m.p.h., (at 34,000 lb.), 307 m.p.h.; range (max. payload), 267 mls. **Dimensions:** Span, 95 ft. 2 in.; length, 75 ft. 9 in.; height, 27 ft. 6 in.; wing area, 754 sq. ft.



GRUMMAN W2F-1 HAWKEYE

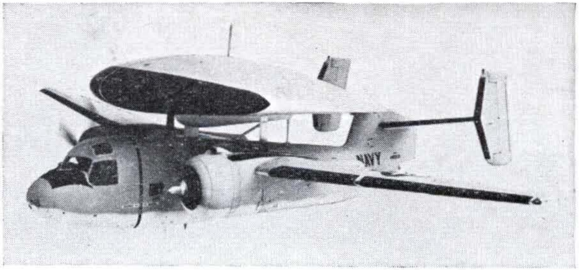
The W2F-1 Hawkeye, flown for the first time on October 21, 1960, has been designed for the early warning radar protection of Navy task forces. Carrying five crew members, the Hawkeye has been designed to loiter at maximum endurance air speeds for periods of at least twelve hours. The circular rotodome over the fuselage revolves at a 6 r.p.m. scanning speed and provides both height-finding and azimuth target information. The Hawkeye is a potential successor to the Tracer.

Nationality: American. **Type:** Shipboard Early Warning Aircraft. **Power Plants:** Two 4,050 e.h.p. Allison T56-A-8 turboprops. **Weight:** Max. loaded, 49,500 lb. **Performance:** No details available for publication. **Dimensions:** Span, 80 ft. 7 in.; length, 56 ft. 4 in.; height, 16 ft.

GRUMMAN WF-2 TRACER

Evolved from the TF-1 Trader for shipboard early warning duties, the WF-2 Tracer carries a crew of four, including two warning system operators. The wings fold back to lie along the fuselage sides instead of upwards as on the TF-1, and an entirely new tail assembly is fitted. The first of sixty-four production Tracers flew in February 1958, and the type entered service with the U.S. Atlantic Fleet in 1960.

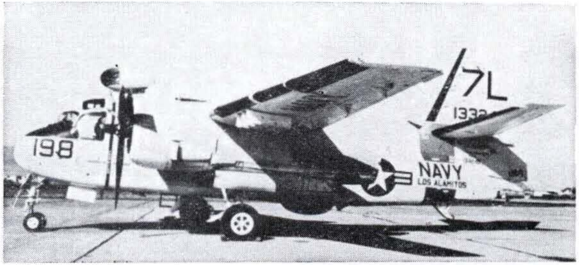
Nationality: American. **Type:** Shipboard Early Warning Aircraft. **Power Plants:** Two 1,525 h.p. Wright R-1820-82A radials. **Weights:** Empty, 21,024 lb.; loaded, 23,882 lb. **Performance:** No details available for publication. **Dimensions:** Span, 72 ft. 4 in.; length, 45 ft. 4 in.; height, 16 ft. 10 in.; wing area, 506 sq. ft.



GRUMMAN S2F-1 TRACKER

Standard equipment aboard U.S. Navy anti-submarine aircraft carriers and equipping many U.S. Navy Air Reserve squadrons, the S2F-1 Tracker also serves with Brazilian, Canadian, Japanese, Dutch and Italian anti-submarine squadrons. The Tracker has been manufactured in Canada as the CS2F-1 and -2.

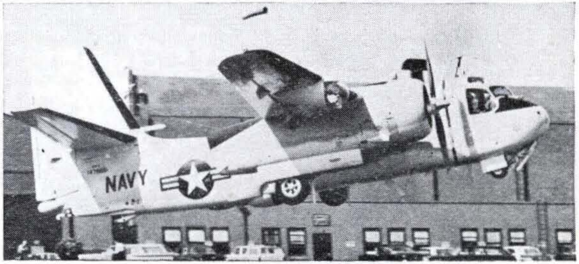
Nationality: American. **Type:** Four-seat Anti-submarine Aircraft. **Power Plants:** Two 1,525 h.p. Wright R-1820-82 radials. **Weights:** Empty weight, 16,700 lb.; loaded, 21,559 lb.; max., 24,000 lb. **Performance:** Max. speed, 287 m.p.h.; cruising, 172 m.p.h. at 5,000 ft.; initial climb, 1,920 ft./min.; time to 5,000 ft., 4 min.; max. range, 920 mls.; endurance, 8 hrs. **Dimensions:** Span, 69 ft. 8 in.; length, 42 ft. 3 in.; height, 16 ft. 3½ in.; wing area, 466 sq. ft.

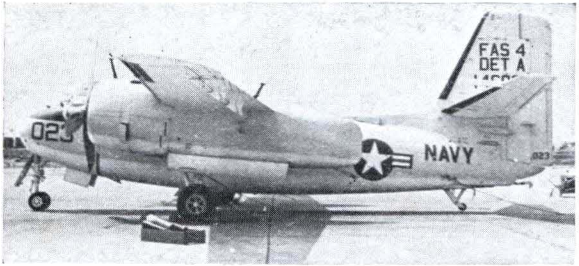


GRUMMAN S2F-3 TRACKER

First flown on May 21, 1959, the S2F-3 is an improved version of the original S2F-1 Tracker which it is currently supplanting in U.S. Navy service. By comparison with the original model, the S2F-3 has increased wingspan, enlarged tail surfaces, increased fuel capacity, wingtip-mounted electronic countermeasures antennae, and modified engine nacelle configuration permitting an increase in the number of sonobuoys housed. A typical warload for the S2F-3 might comprise two *Lulu* nuclear depth charges in the bomb-bay, and four General Electric Mk. 44 acoustic homing torpedoes and two 5-in. rockets underwing. No details of the S2F-3 have been revealed.

Dimensions: Span, 72 ft. 7 in.; length, 43 ft. 6 in.; height, 16 ft. 7 in.

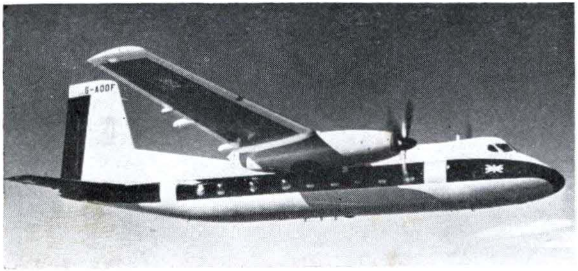




GRUMMAN TF-1 TRADER

The TF-1 Trader is a general utility shipboard transport and trainer employing many of the components of the S2F-1, including the power plants and outer wings of the S2F-1 and the enlarged tail of the S2F-2 and -3. These are married to a new fuselage which can accommodate nine passengers or a 3,500-lb. freight load. Equipped with the latest navigational devices, the TF-1 is suitable for use as an all-weather operational carrier trainer.

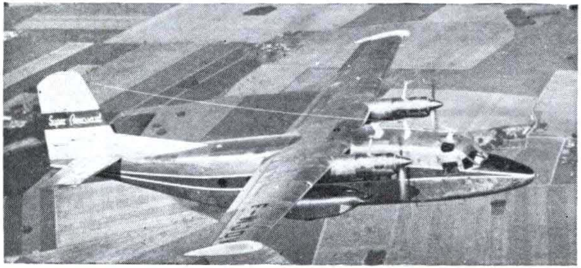
Nationality: American. **Type:** Shipboard Utility Transport and Trainer. **Power Plants:** Two 1,525 h.p. Wright R-1820-82 radials. **Weights:** No details available. **Performance:** No details available. **Dimensions:** Span, 69 ft. 8 in.; length, 42 ft.; height, 16 ft. 3 in.; wing area, 466 sq. ft.



HANDLEY PAGE HERALD SRS. 100

First flown on March 11, 1958, the H.P.R.7 Herald is being produced in two versions, the Series 100, three examples of which were scheduled to be delivered to B.E.A. during 1961, and the Series 200 with an extra 42-in. fuselage extension forward of the wing. Six Series 200 Heralds have been ordered by Jersey Airlines.

Nationality: British. **Type:** Short- and Medium-haul Commercial Transport. **Power Plants:** Two 2,105 e.h.p. Rolls-Royce Dart 527 turboprops. **Weights:** Basic, 24,220 lb.; max. loaded, 39,000 lb. **Performance:** Recommended cruising, 275 m.p.h. at 15,000 ft.; range cruising, 306 m.p.h. at 23,000 ft.; range (max. payload), 864 mls. **Dimensions:** Span, 94 ft. $4\frac{1}{2}$ in.; length, 71 ft. 11 in.; height, 23 ft. 4 in.; wing area, 886 sq. ft.



HOLSTE M.H.260 SUPER BROUSSARD

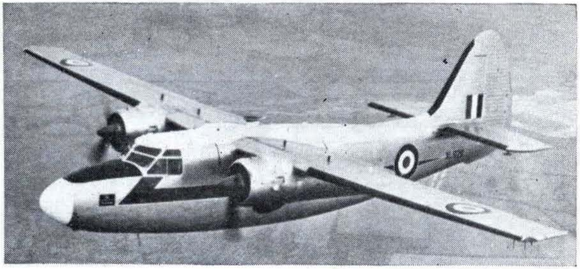
Currently being manufactured by Nord-Aviation, the M.H.260 was first flown on July 29, 1960, and four pre-production aircraft were scheduled to fly by October 1961, current plans calling for a delivery rate of four aircraft per month by January 1963. A pressurised development, the M.H.262, will have the same general configuration as the M.H.260.

Nationality: French. **Type:** Light Commercial Transport. **Power Plants:** Two 960 b.h.p. Turboméca Bastan turboprops. **Accommodation:** 17–23 passengers. **Weights:** Empty, 9,735 lb.; loaded, 16,975 lb.; max., 21,164 lb. **Performance:** Max. continuous cruising, 245 m.p.h. at 9,842 ft.; econ. cruising, 217 m.p.h.; range, 621 mls. **Dimensions:** Span, 71 ft. $8\frac{1}{4}$ in.; length, 58 ft. $1\frac{1}{4}$ in.; height, 20 ft. 11 in.; wing area, 586·63 sq. ft.

HUNTING P.66 PEMBROKE C.1

Evolved from the P.50 Prince, the Pembroke has been built in some numbers for the R.A.F. and various foreign air forces. First flown on November 20, 1952, the Pembroke C.1 was ordered by the R.A.F. as a staff transport, forty-two being delivered, together with six Pembroke C.(P.R.)1s for the dual communications/reconnaissance rôle. Only a small number of the commercial equivalent, the President, were built.

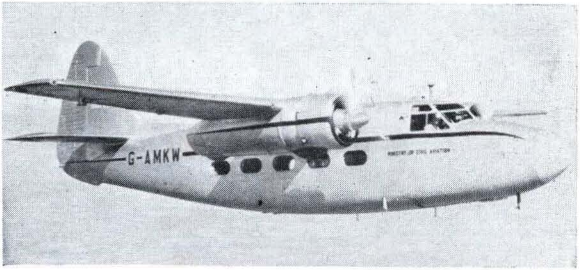
Nationality: British. **Type:** Utility Transport. **Power Plants:** Two 540 h.p. Alvis Leonides 127 radials. **Accommodation:** 8-10 passengers. **Weights:** Empty, 9,178 lb.; loaded, 13,500 lb. **Performance:** Max. speed, 224 m.p.h. at 2,000 ft.; econ. cruising, 155 m.p.h. at 8,000 ft. **Dimensions:** Span, 64 ft. 6 in.; length, 46 ft.; height, 16 ft. 1 in.; wing area, 400 sq. ft.



HUNTING P.50 PRINCE III

The Prince was first flown on May 13, 1948, and variants included the Series I with an all-up weight of 10,650 lb. and 520 h.p. Leonides 501/4 engines; the Series II with an all-up weight of 11,000 lb.; the Series III described by the specification; the P.54 aerial survey version, and the P.57 Sea Prince for the Royal Navy. The Srs. IIIB is illustrated.

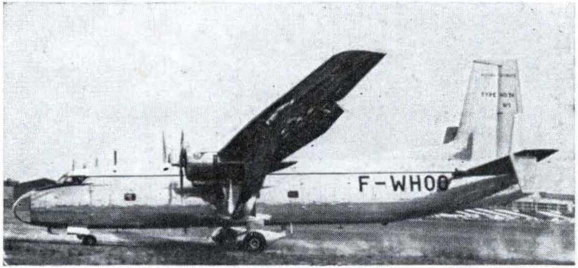
Nationality: British. **Type:** Light Civil Feeder-liner. **Power Plants:** Two 550 h.p. Alvis Leonides 502/4 radials. **Accommodation:** 8–12 passengers. **Weights:** Empty, 8,038 lb.; loaded, 11,000 lb. **Performance:** Max. speed, 229 m.p.h. at 5,000 ft.; max. cruising, 212 m.p.h.; initial climb, 1,650 ft./min.; max. range, 902 mls. at 159 m.p.h. **Dimensions:** Span, 56 ft.; length, 42 ft. 10 in.; height, 16 ft. 1 in.; wing area, 365 sq. ft.

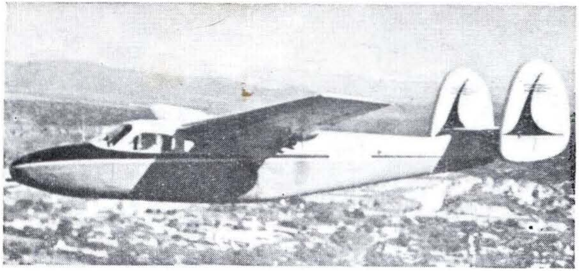


HUREL-DUBOIS H.D.34

Derived from the H.D.31 and H.D.32 transport prototypes, the H.D.34 is a photographic survey aircraft, eight examples having been supplied to the French Institut Géographique National. Like its predecessors, the H.D.34 possesses a wing of unusually high aspect ratio, and the first aircraft of this type flew on February 26, 1957. A crew of five is carried including two camera operators for the four vertical and oblique cameras.

Nationality: French. **Type:** Photographic Aircraft. **Power Plants:** Two 1,525 h.p. Wright 982-C9 HE1 radials. **Weights:** Empty, 26,455 lb.; loaded, 41,200 lb. **Performance:** Cruising speed, 172 m.p.h. at 9,840 ft.; initial climb rate, 940 ft./min.; max. endurance, 14 hr. **Dimensions:** Span, 148 ft. 7½ in.; length, 77 ft. 3⅞ in.; height, 28 ft. 7½ in.; wing area, 1,076·39 sq. ft.

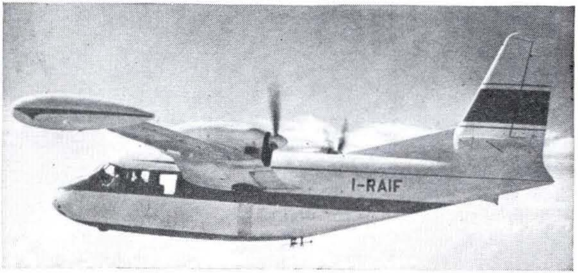




I.A.45B QUERANDI

Produced by the Instituto Aerotécnico, a division of the State enterprise DINFIA, the Querandi first flew on September 23, 1957, the first production model being completed in October 1959. The initial model, the I.A.45A, was a five-seater powered by 150 h.p. Lycoming o-320 engines, and the more powerful six-seat I.A.45B is described by the specification.

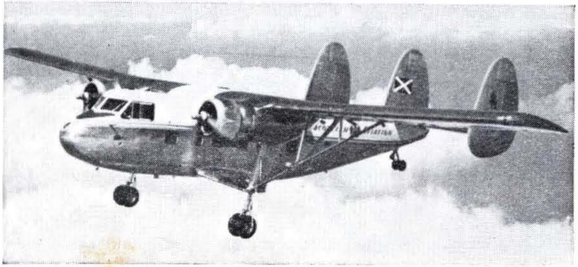
Nationality: Argentinian. **Type:** Light Transport. **Power Plants:** Two 180 h.p. Lycoming o-360 engines. **Weights:** Empty, 2,580 lb.; loaded, 3,968 lb. **Performance:** Max. speed, 171 m.p.h. at sea level; cruising, 152 m.p.h.; initial climb, 1,380 ft./min.; absolute ceiling, 24,600 ft.; range (at 75% power with 30 min. reserves), 680 mls. **Dimensions:** Span, 45 ft. 2 in.; length, 29 ft. 3 in.; height, 9 ft .2 in.; wing area, 207·7 sq. ft.



PIAGGIO P.166

Based on the design of the P.136 amphibian (page 265), the P.166 flew for the first time on November 26, 1957. Assembled in the U.S.A. it is known as the Trecker 166, and the type currently serves with business users in both Europe and the U.S.A. Twenty-one aircraft of this type have been ordered by the Italian Air Force for communications duties.

Nationality: Italian. **Type:** Light Transport. **Power Plants:** Two 340 h.p. Lycoming GSO-480-B1C6 engines. **Accommodation:** 4-6 passengers. **Weights:** Empty, 5,070 lb.; loaded, 8,115 lb. **Performance:** Max. speed, 222 m.p.h. at 9,500 ft.; cruising (75% power), 207 m.p.h. at 12,800 ft.; initial climb, 1,240 ft./min.; service ceiling, 25,500 ft. **Dimensions:** Span, 46 ft. 9 in.; length, 38 ft. 1 in.; height, 16 ft. 5 in.; wing area, 285·9 sq. ft.



SCOTTISH AVIATION TWIN PIONEER SERIES 3

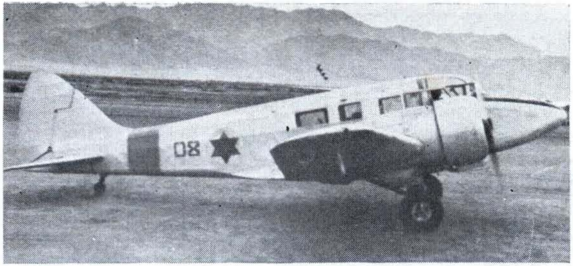
Three production versions of the Twin Pioneer have been produced: the Series 1 with 550 h.p. Leonides 514/8 engines (illustrated); the Series 2 with Pratt and Whitney R-1340 engines, and the Series 3 described by the specification. Thirty-six machines basically similar to the Series 1 have been supplied to the R.A.F. as the Twin Pioneer C.C.1.

Nationality: British. **Type:** Light Civil and Military Transport. **Power Plants:** Two 640 h.p. Alvis Leonides 531/8B radials. **Accommodation:** 16-19 passengers. **Weights:** Empty, 10,062 lb.; max. loaded, 14,600 lb. **Performance:** Max. cruising speed, 158 m.p.h. at 2,500 ft.; econ. cruising, 134 m.p.h.; initial climb, 1,250 ft./min.; range, 576 mls. **Dimensions:** Span, 76 ft. 6 in.; length, 45 ft. 3 in.; height, 12 ft. 3 in.; wing area, 670 sq. ft.

AIRSPEED A.S.65 CONSUL

A substantial number of wartime A.S.10 Oxford trainer airframes were converted for light transport duties during the immediate post-war years as A.S.65 Consuls. The Consul features a new nose section, a reset tailplane and a new window arrangement. The example illustrated belongs to the Israeli Defence Force/Air Force.

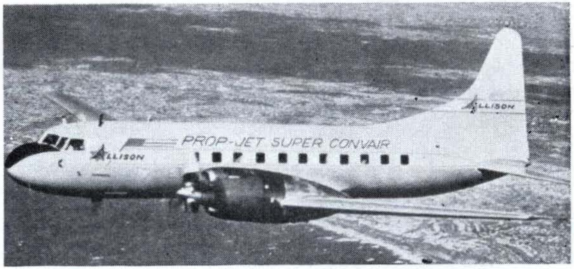
Nationality: British. **Type:** Light Passenger and Freight Transport. **Power Plants:** Two 395 h.p. Armstrong Siddeley Cheetah 10 radials. **Accommodation:** 5–6 passengers. **Weights:** Empty, 6,047 lb.; loaded, 8,250 lb. **Performance:** Max. cruising speed, 156 m.p.h.; initial climb, 1,180 ft./min.; max. range at econ. cruising, 900 mls. **Dimensions:** Span, 53 ft. 4 in.; length, 35 ft. 4 in.; height, 10 ft. 1½ in.; wing area, 348 sq. ft.



ALLISON SUPER CONVAIR

The Allison Division of General Motors is the prime contractor in a conversion programme under which Convair CV-340 and CV-440 aircraft can be brought up to Super Convair standards. This entails replacing the original piston engines with turboprops and increasing the tail surface areas. The first Super Convair was delivered to a corporate owner in September 1960.

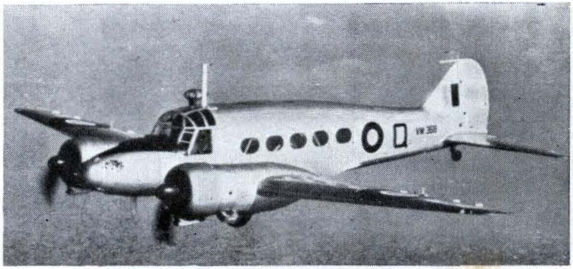
Nationality: American. **Type:** Medium-range Commercial Transport. **Power Plants:** Two 3,750 e.s.h.p. Allison 501-D13 turboprops. **Accommodation:** 44–77 passengers. **Weight:** Max. loaded, 53,200 lb. **Performance:** Cruising speed, 342 m.p.h. at 20,000 ft.; range (with 8,000 lb. payload), 1,540 mls. **Dimensions:** Span, 105 ft. 4 in.; length, 81 ft. 6 in.; height, 29 ft. 2 in.; wing area, 920 sq. ft.

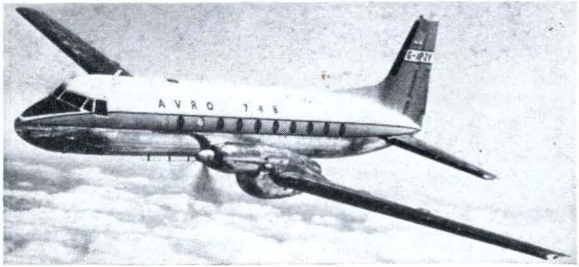


AVRO TYPE 652A ANSON

First flown on March 23, 1935, the Anson continued in production until May 1952, 11,020 examples being built. Some 200 remain in R.A.F. service, these being the C.19 (illustrated) and C.21 communications models and T.21 navigational and radio training model. A considerable number of Avro XIX feeder-liners—the civil variant of the Anson C.21—and commercial conversions of earlier Ansons are flying.

Nationality: British. **Type:** Light Civil and Military Transport. **Power Plants:** Two 420 h.p. Armstrong Siddeley Cheetah 15 radials. **Accommodation:** 6–9 passengers. **Weights:** Empty, 7,419 lb.; loaded, 10,400 lb. **Performance:** Max. speed, 190 m.p.h.; econ. cruising, 155 m.p.h. **Dimensions:** Span, 56 ft. 6 in.; length, 42 ft. 3 in.; height, 13 ft. 6 in.; wing area, 440 sq. ft.

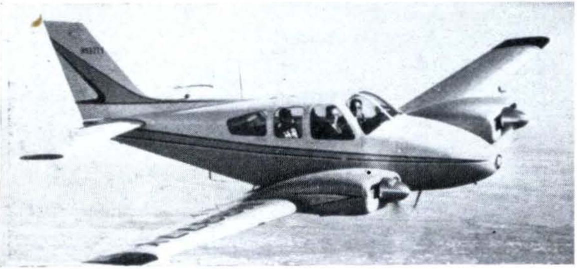




AVRO 748 SERIES 1

The Avro 748 is being produced in two versions: the Series 1 described by the specification, and the Series 2 with 2,105 e.h.p. Dart 531 engines and a loaded weight of 36,000 lb. The Series 1 has been ordered by Aerolineas Argentinas, Skyways and B.K.S., and the Series 2 by Aden Airways. A military version of the Series 2 is to be built in India for the I.A.F.

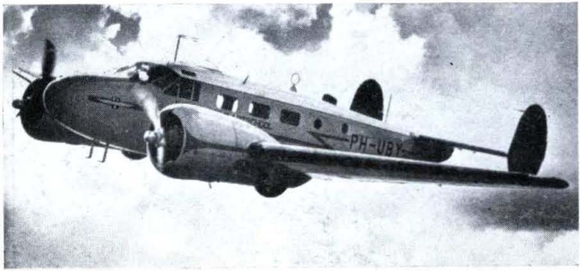
Nationality: British. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Two 1,740 e.h.p. Rolls-Royce Dart 514 turboprops. **Accommodation:** 40–44 passengers. **Weights:** Empty, 19,444 lb.; max. loaded, 33,000 lb. **Performance:** Max. recommended cruising speed, 265 m.p.h. at 20,000 ft.; range (with 9,666-lb. payload), 668 mls. **Dimensions:** Span, 95 ft.; length, 67 ft.; height, 24 ft. 10 in.; wing area, 795 sq. ft.



BEECH MODEL 55 BARON

Employing major components of the Model 95 Travel Air, the Baron has enlarged seating and baggage capacity, a larger swept tail, and more powerful engines. Production deliveries of the Baron commenced in November 1960, and a production rate of one aircraft per day had been attained by the beginning of 1961.

Nationality: American. **Type:** Five-seat Light Commercial Aircraft. **Power Plants:** Two 260 h.p. Continental IO-470-L engines. **Weights:** Empty, 2,960 lb.; loaded, 4,880 lb. **Performance:** Max. speed, 230 m.p.h. at sea level; cruising (75% power), 220 m.p.h. at 7,000 ft., (65% power), 216 m.p.h. at 10,500 ft.; initial climb, 1,630 ft./min.; service ceiling, 19,200 ft.; range, 1,220 mls. **Dimensions:** Span, 37 ft. 10 in.; length, 25 ft. 8 in.; height, 9 ft. 7 in.; wing area, 199·2 sq. ft.



BEECH D18S (C-45H AND EXPEDITOR)

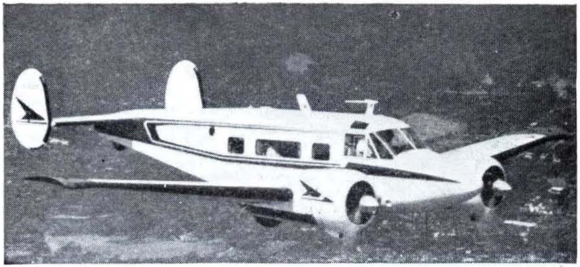
The D18S was the last production version of the Model 18 to be built before the introduction of the extensively modified E18S Super 18. The Model 18 first flew on January 15, 1937, and 5,204 military models were produced during W.W. II as the C-45A, B, C, D, E and F for the U.S.A.A.F., and JRB-1, 2, 3, 4, 5 and 6 for the U.S. Navy. The post-war rebuilt C-45G and H are basically similar to the D18S, and the R.C.A.F. version is named Expeditor.

Nationality: American. **Type:** Light Transport. **Power Plants:** Two 450 h.p. Pratt and Whitney R-985-B5 radials. **Accommodation:** 5–7 passengers. **Weights:** Empty, 5,770 lb.; loaded, 8,750 lb. **Performance:** Max. speed, 230 m.p.h.; cruising, 211 m.p.h.; initial climb, 1,190 ft./min. **Dimensions:** Span, 47 ft. 7 in.; length, 33 ft. 11½ in.; height, 9 ft. 2½ in.; wing area, 349 sq. ft.

BEECH G18S SUPER 18

The Super 18 is an extensively modified development of the D18S illustrated on the previous page, the first production model, the E18S, having appeared in 1954. The Super 18 features increased wing span, integral entrance steps, and many refinements resulting in an all-round improvement in performance. The G18S can be fitted with JATO rockets.

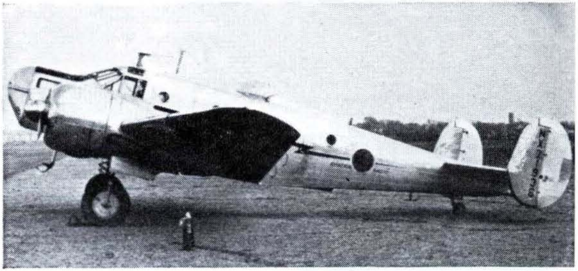
Nationality: American. **Type:** Light Transport. **Power Plants:** Two 450 h.p. Pratt and Whitney R-985-AN14B radials. **Accommodation:** 5–9 passengers. **Weights:** Empty, 5,950 lb.; loaded, 9,700 lb. **Performance:** Max. speed, 233 m.p.h. at 4,500 ft.; cruising, 214 m.p.h. at 10,000 ft.; initial climb, 1,410 ft./min.; range, 1,585 mls. **Dimensions:** Span, 49 ft. 8 in.; length, 35 ft. 2⅝ in.; height, 9 ft. 8 in.; wing area, 361 sq. ft.



BEECH AT-11 KANSAN

Evolved from the C-45 (Model 18) light transport as a specialised bombing and gunnery trainer, the AT-11 appeared in 1941. The Kansan was redesignated T-11A and T-11B in the post-war U.S.A.F., the former being a navigational training variant of which only thirty-six examples were produced, and a substantial number of the 1,582 Kansans built were re-manufactured as C-45G and H transports. Many wartime AT-11 Kansans are used by corporate owners, and others serve with various air arms.

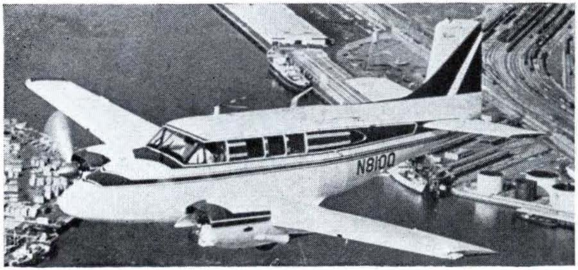
Nationality: American. **Type:** Light Civil Transport and Military Trainer. **Power Plants:** Two 450 h.p. Pratt and Whitney R-985-AN-3 radials. **Weights:** Empty, 6,160 lb.; loaded, 8,730 lb. **Performance** and **Dimensions:** As D18S apart from length of 34 ft. 3 in.

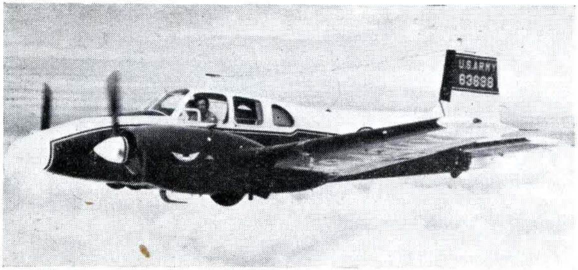


BEECH 65 QUEEN AIR (L-23F)

The Queen Air is a commercial version of the L-23F transport which flew on August 28, 1958. The L-23F differs from the L-23E illustrated on page 278 in having an entirely redesigned fuselage, and is in production for the U.S. Army. A business aircraft incorporating many airliner features, the Queen Air established an altitude record for its class by attaining 34,862 ft.

Nationality: American. **Type:** Light Executive and Transport Aircraft. **Power Plants:** Two 340 h.p. Lycoming IGSO-480-A1A6 engines. **Accommodation:** 5–6 passengers. **Weights:** Empty, 4,740 lb.; loaded, 7,700 lb. **Performance:** Max. speed, 239 m.p.h.; max. cruising, 214 m.p.h.; initial climb, 1,300 ft./min. **Dimensions:** Span, 45 ft. 10½ in.; length, 33 ft. 4 in.; height, 14 ft. 2 in.; wing area, 277·06 sq. ft.

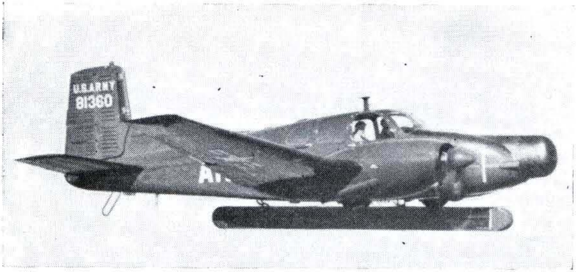




BEECH L-23E SEMINOLE

The Seminole is a light transport and liaison version of the commercial Model 50. Variants include the L-23A and B, the latter having metal airscrews in place of the earlier wooden airscrews, the L-23C which is a standard commercial D50, the L-23D with supercharged 340 h.p. engines for improved performance, and the L-23E described below which conforms to the commercial D50A and reverts to lower-powered engines.

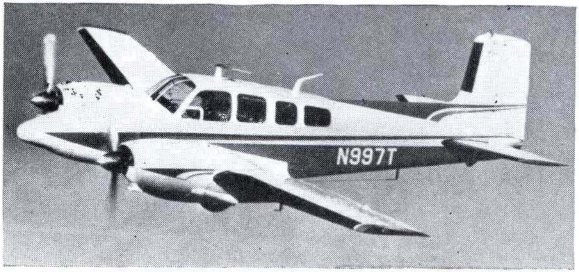
Nationality: American. **Type:** Six-seat Utility Monoplane. **Power Plants:** Two 295 h.p. Lycoming GSO-480-G2D6 engines. **Weights:** Empty, 4,090 lb.; loaded, 6,030 lb. **Performance:** Max. speed, 214 m.p.h.; cruising, 203 m.p.h. at 7,000 ft.; initial climb, 1,450 ft./min. **Dimensions:** Span, 45 ft. 3⅜ in.; length, 31 ft. 6½ in.; height, 11 ft. 4 in.; wing area, 277 sq. ft.



BEECH RL-23D

The RL-23D is a variant of the L-23D modified to carry Motorola APS-85 battlefield-surveillance radar and provide scanning platforms for plotting enemy positions and movements. Other RL-23Ds carry Texas Instruments' UPD-1 or APQ-86 SLAR (Side-Looking Airborne Radar). Whereas the APS-85 is housed in a hemispherical nose fairing and long, torpedo-like container (as illustrated), the UPD-1 is housed in a bulged ventral fairing.

Nationality: American. **Type:** Radar Reconnaissance Aircraft. **Power Plants:** Two 340 h.p. Lycoming GSO-480-B1B6 engines. **Weights:** Empty, 5,954 lb.; loaded, 7,350 lb. **Performance:** Max. speed, 230 m.p.h.; initial climb, 1,463 ft./min. **Dimensions:** Span, 50 ft. 3½ in.; length, 31 ft. 11 in.; height, 11 ft. 6 in.; wing area, 293·9 sq. ft.



BEECH D50E TWIN BONANZA

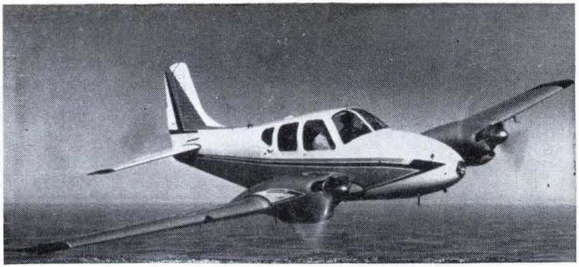
The first U.S. post-war twin-engined light commercial aircraft to attain quantity production, the Twin Bonanza flew on November 15, 1949, and several externally similar versions have since been manufactured. Current models include the D50E described below and the J50 with 340 h.p. Lycoming IGSO-480-A1B6s

Nationality: American. **Type:** Light Commercial Cabin Monoplane. **Power Plants:** Two 295 h.p. Lycoming GO-480-G2F6 engines. **Accommodation:** Six passengers. **Weights:** Empty, 4,100 lb.; loaded, 6,300 lb. **Performance:** Max. speed, 214 m.p.h. at 2,500 ft.; cruising (70% power), 203 m.p.h. at 7,000 ft.; initial climb, 1,450 ft./min.; service ceiling, 20,000 ft.; max. range, 1,650 mls. at 160 m.p.h. **Dimensions:** Span, 45 ft. 3⅜ in.; length, 31 ft. 6½ in.; height, 11 ft. 4 in.; wing area, 277 sq. ft.

BEECH B95A TRAVEL AIR

Flown for the first time on August 6, 1956, the Travel Air is essentially a scaled-down Twin Bonanza, possessing the cabin of the Model 35 Bonanza married to the Model 45 Mentor's wings, tail and undercarriage and an entirely new fuselage. The current B95A Travel Air has a 19-in. longer cabin than the initial production model, and an enlarged tailplane.

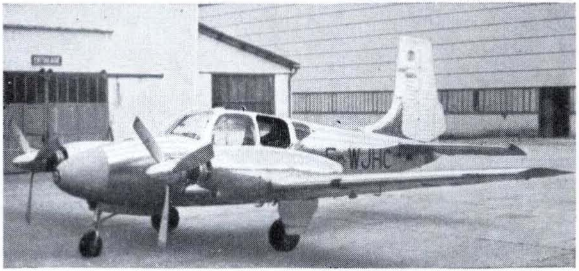
Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plants:** Two 180 h.p. Lycoming O-360-B1A engines. **Weights:** Empty, 2,555 lb.; loaded, 4,200 lb. **Performance:** Max. speed, 210 m.p.h. at sea level; max. cruising, 200 m.p.h. at 7,500 ft.; initial climb rate, 1,250 ft./min.; service ceiling, 18,100 ft.; max. range, 1,410 mls. **Dimensions:** Span, 37 ft. 10 in.; length, 25 ft. 4 in.; height, 9 ft. 6 in.; wing area, 193·8 sq. ft.



BEECH-SFERMA PD.146 MARQUIS

The Marquis has been developed from the Travel Air by SFERMA (Société Française d'Entretien et de Réparation de Matériel Aéronautique) in co-operation with Beech, the latter concern having supplied the airframes for the prototype and the initial batch of eight machines. The engine installation and related components are produced by SFERMA, and the prototype Marquis flew for the first time on July 12, 1960.

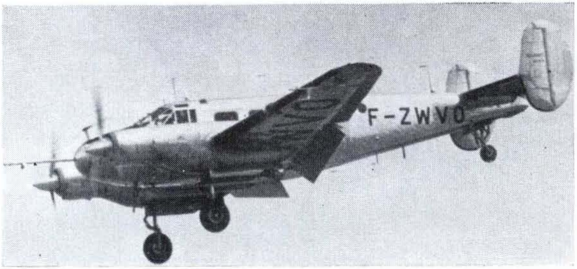
Nationality: Franco-American. **Type:** Four-seat Cabin Monoplane. **Power Plants:** Two 450 s.h.p. Turboméca Astazou turboprops. **Weights:** Empty, 2,965 lb.; loaded, 5,400 lb. **Performance:** Max. speed, 285 m.p.h.; max. cruising, 267 m.p.h.; initial climb, 3,150 ft./min.; range 810 mls. **Dimensions:** As for the B95 Travel Air.

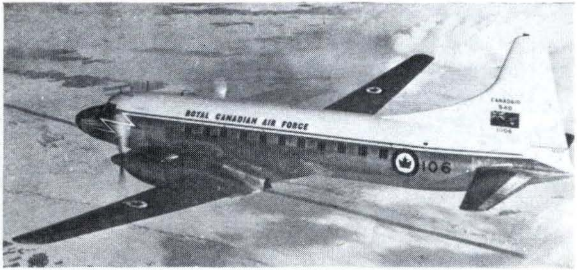


BEECH-SFERMA PD.18S

Flown for the first time on September 18, 1958, the PD.18S is a conversion of the Beech D18S to take turboprops driving Ratier-Figeac variable-pitch airscrews. Two PD.18S aircraft were ordered by the Technical Department of the French Secretary of State for Air, and a third machine with increased fuel capacity is being used by SFERMA as a demonstration aircraft. The airframe is built primarily of Beech-manufactured components, and the engine installation is carried out by SFERMA.

Nationality: Franco-American. **Type:** Light Transport. **Power Plants:** Two 700 s.h.p. Turboméca Bastan turboprops. **Accommodation:** 5–7 passengers. **Weight:** Loaded, 9,810 lb. **Performance:** Max. speed, 255 m.p.h. **Dimensions:** Span, 47 ft. 7 in.; length, 35 ft. $5\frac{1}{8}$ in.; height, 9 ft. $2\frac{1}{2}$ in.; wing area, 349 sq. ft.

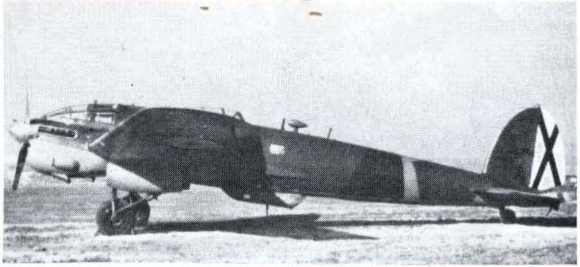




CANADAIR 540 (CL-66)

The Canadair 540, or CL-66, comprises a new Canadair-built Convair CV-440-61 airframe fitted with Eland turboprops. Convair CV-440 airframes originally built by the parent company and fitted with Elands are designated Convair 540s. Ten examples of a military version (illustrated) for the R.C.A.F. and based on CV-440-72 airframes (540-B) are designated CC-109 by that service, and two 52-passenger models (540-C) have been delivered to Quebecair.

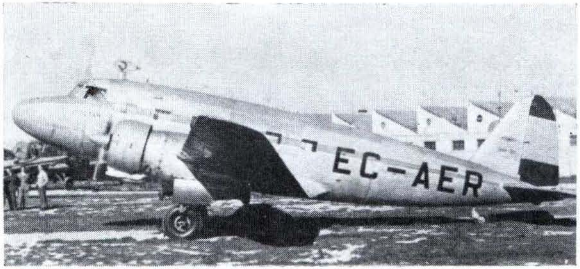
Nationality: Canadian. **Type:** Medium-range Transport. **Power Plants:** Two 3,500 e.s.h.p. Napier Eland 504A turboprops. **Accommodation:** 48–52 passengers. **Weights:** Empty, 31,734 lb.; loaded, 53,200 lb. **Performance:** Max. speed, 340 m.p.h.; cruising, 322 m.p.h. **Dimensions:** Similar to CV-440.



C.A.S.A. 2.111-D (B.21)

C.A.S.A. began the licence manufacture of the Heinkel He 111H-16 medium bomber in 1941, and 236 were ordered for the Spanish Air Force. One hundred and thirty were completed with 1,340 h.p. Jumo 211F engines, but subsequent machines were Merlin-powered. Several variants have been produced and currently serve with the Spanish Air Force. These include the 2.111-B (illustrated) and -D reconnaissance-bombers, and the 2.111-F trainer, and a transport version illustrated on page 51.

Nationality: Spanish. **Type:** Five-seat Medium Bomber. **Power Plants:** Two 1,400 h.p. Rolls-Royce Merlin 500 engines. **Weight:** Max. loaded, 30,865 lb. **Performance:** Max. speed, 260 m.p.h.; cruising, 233 m.p.h. **Dimensions:** Span, 74 ft. 3 in.; length, 54 ft. 6 in.; height, 13 ft. 9 in.; wing area, 942·917 sq. ft.



C.A.S.A. 201 ALCOTAN

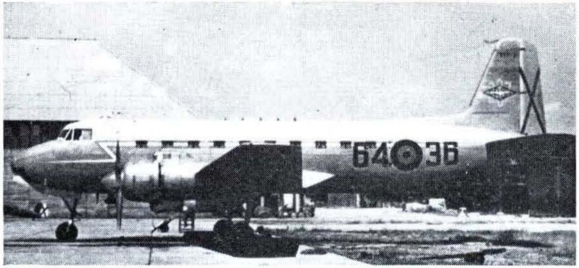
One hundred and twelve Alcotans have been built, the majority of these having been delivered to the Spanish Air Force, variants including the 201-B transport, the 201-F navigational and radio trainer, and the 201-G bombing and photographic trainer. Four Alcotans were fitted with Cheetah 27s, one with Wasp Juniors and one with Leonides, but the Sirio-VIIA is standard.

Nationality: Spanish. **Type:** Light Transport and Trainer. **Power Plants:** Two 500 h.p. ENMA Sirio-VIIA radials. **Weights:** Empty, 7,920 lb.; loaded, 12,150 lb. **Performance:** Max. speed, 219 m.p.h.; cruising, 193 m.p.h. at 6,590 ft.; range, 621 mls.; service ceiling, 20,000 ft.; normal endurance (at econ. cruising), 4 hr. **Dimensions:** Span, 60 ft. 4 in.; length, 45 ft. 3 in.; height, 12 ft. 8 in.; wing area, 450 sq. ft.

C.A.S.A. 207 AZOR

The Azor is as yet the largest Spanish aircraft of indigenous design to have been built, and ten aircraft of this type have been built for the Spanish Air Force. Two pre-production examples of the Azor have been fitted with 2,400 h.p. Pratt and Whitney R-2800 engines in place of the standard Hercules.

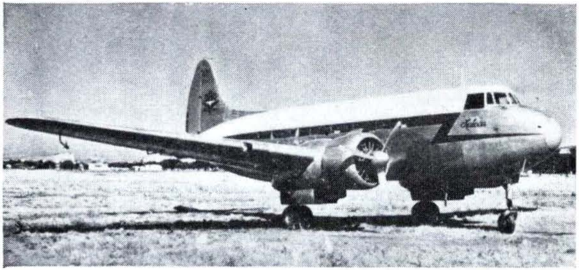
Nationality: Spanish. **Type:** Medium-range Military Transport. **Power Plants:** Two 2,040 h.p. Bristol Hercules 730 radials. **Accommodation:** 36 passengers. **Weights:** Empty, 21,665 lb.; loaded, 34,510 lb. **Performance:** Max. speed, 285 m.p.h. at 6,100 ft.; cruising, 266 m.p.h. at 12,340 ft.; range (max. payload), 690 mls., (with 4,850-lb. payload), 1,840 mls. at 236 m.p.h. at 6,550 ft.; service ceiling, 28,215 ft. **Dimensions:** Span, 91 ft. 2 in.; length, 68 ft. 5 in.; height, 25 ft. 5 in.; wing area, 924 sq. ft.



C.A.S.A. 202 HALCÓN

The Halcón, which flew for the first time in May 1952, suffered a somewhat protracted development, and a production batch of twenty machines was in hand in 1960 to an order from the Spanish government. One prototype which flew in 1956, the 202B, was fitted with two 1,300 h.p. Wright Cyclone R-1820-56 radials, and represented a major redesign of the original model with lengthened fuselage and reduced wing span and area.

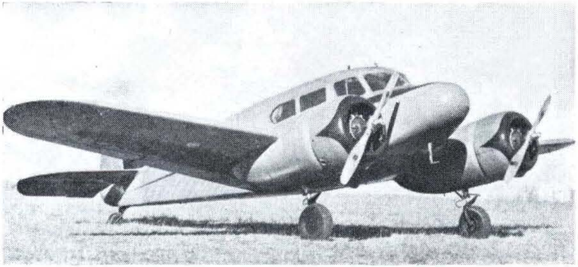
Nationality: Spanish. **Type:** Light Transport. **Power Plants:** Two 775 h.p. ENMA Beta 9C-29-750 radials. **Accommodation:** 14 passengers. **Weights:** Empty, 11,580 lb.; loaded, 18,080 lb. **Performance:** Max. speed, 192 m.p.h. at sea level, 230 m.p.h. at 9,315 ft.; cruising, 205 m.p.h. **Dimensions:** Span, 70 ft. 9 in.; length, 52 ft. 6 in.; height, 19 ft. 9 in.; wing area, 617·6 sq. ft.

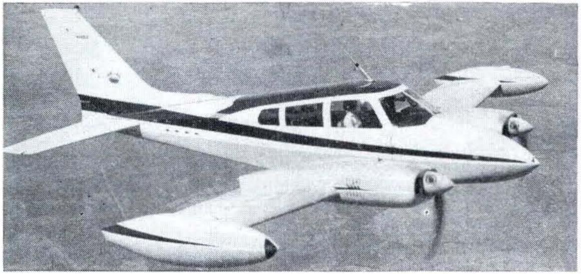


CESSNA T-50 (BOBCAT)

The T-50 was introduced in 1939 as a light commercial five-seater, and during the following year it was adopted by the R.C.A.F. as a trainer, the name "Crane" being given. The U.S.A.A.F. subsequently ordered the T-50 as the AT-17 transitional trainer and UC-78 light transport, 4,636 trainer and transport models being delivered. A substantial number of surplus AT-17s and UC-78s are currently operated by civil concerns.

Nationality: American. **Type:** Five-seat Light Transport. **Power Plants:** Two 245 h.p. Jacobs R-755-9 radials. **Weights:** Empty, 4,050 lb.; loaded, 5,700 lb. **Performance:** Max. speed, 179 m.p.h.; initial climb, 1,525 ft./min.; cruising range, 750 mls. **Dimensions:** Span, 41 ft. 11 in.; length, 32 ft. 9 in.; height, 9 ft. 11 in.; wing area, 295 sq. ft.

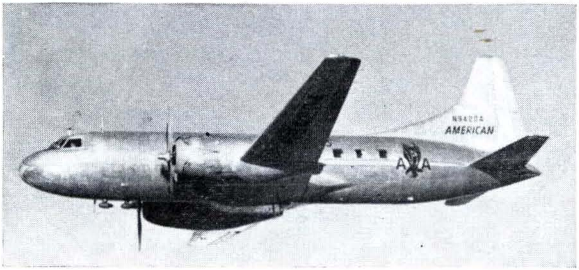




CESSNA 310F

The Cessna 310F is the 1961 production model of the Model 310 which first flew on January 3, 1953, and has since been in continuous production in progressively refined versions. Models prior to the 310D did not feature sweepback on the vertical tail surfaces. The U.S.A.F. has received 160 Model 310Bs which are designated U-3A, and thirty-five Model 310Fs (U-3B).

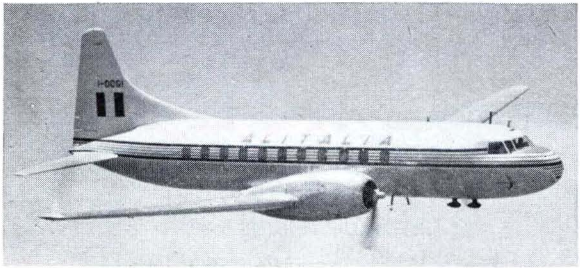
Nationality: American. **Type:** Five-seat Cabin Monoplane. **Power Plants:** Two 260 h.p. Continental IO-470-D engines. **Weights:** Empty, 3,040 lb.; loaded, 4,830 lb. **Performance:** (at 4,830 lb.) Max. speed, 242 m.p.h. at sea level; cruising (70% power), 220 m.p.h. at 8,000 ft.; initial climb, 1,800 ft./min.; service ceiling, 21,300 ft.; range, 1,340 mls. **Dimensions:** Span, 36 ft.; length, 29 ft. 6 in.; height, 9 ft. 11¼ in.; wing area, 175 sq. ft.



CONVAIR CV-240

Currently serving with some fifteen airlines, the CV-240 was evolved from the experimental CV-110, the prototype flying for the first time on March 16, 1947. A total of 176 commercial CV-240s was completed, and more than 100 remain in airline service. Three basic variants were delivered, these differing mainly in the location and type of passenger loading facilities.

Nationality: American. **Type:** Medium-range Commercial Transport. **Power Plants:** Two 2,400 h.p. Pratt and Whitney R-2800-CA18 radials. **Accommodation:** 40 passengers. **Weights:** Empty, 27,600 lb.; loaded, 41,790 lb. **Performance:** Max. speed, 347 m.p.h. at 16,000 ft.; cruising, 270 m.p.h.; range, 1,800 mls. at 270 m.p.h. **Dimensions:** Span, 91 ft. 9 in.; length, 74 ft. 8 in.; height, 26 ft. 11 in.; wing area, 817 sq. ft.



CONVAIR CV-340

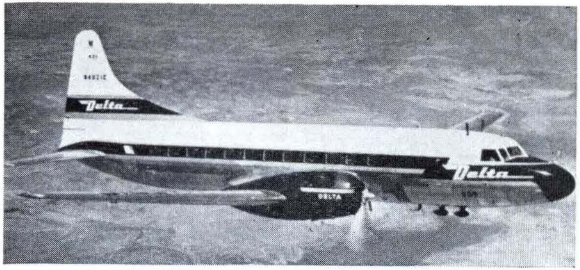
Although derived from the CV-240, the CV-340 is a larger and more powerful aircraft embodying numerous design refinements, and of the 209 commercial models built, 169 were serving with nineteen airlines at the beginning of 1961. The CV-340 flew for the first time on October 5, 1951.

Nationality: American. **Type:** Medium-range Commercial Transport. **Power Plants:** Two 2,400 h.p. Pratt and Whitney R-2800-CB16 radials. **Accommodation:** 44 passengers. **Weights:** Empty, 29,486 lb.; loaded, 47,000 lb. **Performance:** Max. speed, 314 m.p.h. at 16,000 ft.; cruising, 284 m.p.h. at 18,000 ft.; range (with 200 mls. plus 45 min. reserves), 2,015 mls. at 284 m.p.h. at 18,000 ft. **Dimensions:** Span, 105 ft. 4 in.; length, 79 ft. 2 in.; height, 28 ft. 2 in.; wing area, 920 sq. ft.

CONVAIR CV-440 METROPOLITAN

The CV-440, which flew for the first time on October 6, 1955, was a progressive development of the CV-340 with refinements aimed at increasing speed and reducing cabin noise level. The CV-440 was produced with both R-2800-CB16 and -CB17 engines, and in forty-four and fifty-two seat versions, and the first of 153 commercial examples built flew on December 15, 1955.

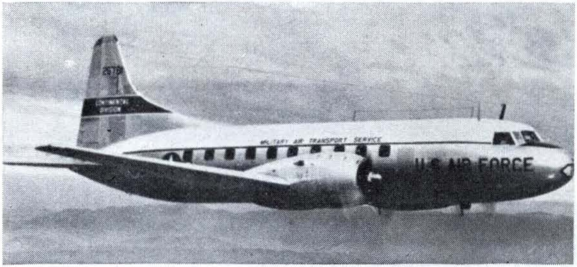
Nationality: American. **Type:** Medium-range Commercial Transport. **Power Plants:** Two 2,500 h.p. Pratt and Whitney R-2800-CB17 radials. **Accommodation:** 44–52 passengers. **Weights:** Empty, 31,305 lb.; loaded, 49,100 lb. **Performance:** Max. speed, 310 m.p.h.; cruising, 289 m.p.h. at 20,000 ft. **Dimensions:** Span, 105 ft. 4 in.; length, 79 ft. 2 in.; height, 28 ft. 2 in.; wing area, 963·82 sq. ft.



CONVAIR C-131A SAMARITAN

The C-131A Samaritan is an air-evacuation transport based on the commercial CV-240. First flown on March 5, 1954, twenty-six Samaritans were delivered to the U.S.A.F. The designation C-131B was applied to thirty-six aircraft similar to the CV-340 and used both as flying laboratories and 48-passenger transports; the designation YC-131C was allocated to two CV-340s with 3,750 e.h.p. Allison YT56-A-3 turboprops; thirty-three CV-340s used for domestic U.S.A.F. transport are designated VC-131D, and the TC-131E is an electronic countermeasures trainer.

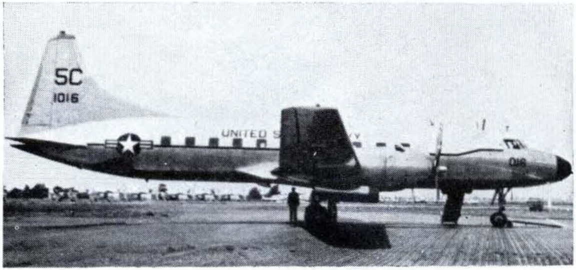
Nationality: American. **Type:** Casualty Transport. **Power Plants:** Two 2,500 h.p. Pratt and Whitney R-2800-99W radials. **Weight:** Loaded, 43,575 lb. **Performance:** Max. speed, 313 m.p.h.; range, 1,600 mls. **Dimensions:** As for CV-240.

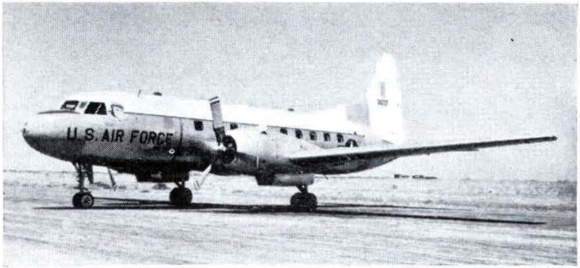


CONVAIR R4Y-1

The R4Y-1 is a cargo, personnel and ambulance version of the CV-340, thirty-six of which were supplied to the U.S. Navy. The first production R4Y-1 flew on June 29, 1955. The R4Y-1Z is a 24-passenger staff transport version, and the designation R4Y-2 has been allocated to two CV-440s serving with the U.S. Navy Bureau of Aeronautics as transport and research aircraft.

Nationality: American. **Type:** General-purpose Medium-range Transport. **Power Plants:** Two 2,500 h.p. Pratt and Whitney R-2800-52W (Mod) radials. **Weights:** Empty, 30,464 lb.; loaded, 47,000 lb. **Performance:** Max. speed, 294 m.p.h. at 16,000 ft.; cruising, 289 m.p.h. at 20,000 ft.; max. range (at econ. cruising), 1,900 mls. **Dimensions:** Span, 105 ft. 4 in.; length, 79 ft. 2 in.; height, 28 ft. 2 in.; wing area, 963·82 sq. ft.

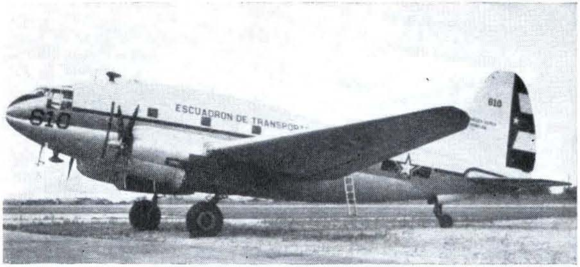




CONVAIR T-29C

A series of training aircraft based on the CV-240 were produced for the U.S.A.F. under the designation T-29. Variants are the T-29A non-pressurised crew trainer, forty-eight examples of which were built; the pressurised T-29B crew trainer, 105 of which were built; the T-29C (illustrated) which differs from the T-29B in power plants and 119 of which were built, and the T-29D, the last-mentioned model being equipped for advanced bombing and navigational training. Ninety-three T-29Ds were produced, and the VT-29E is a personnel transport.

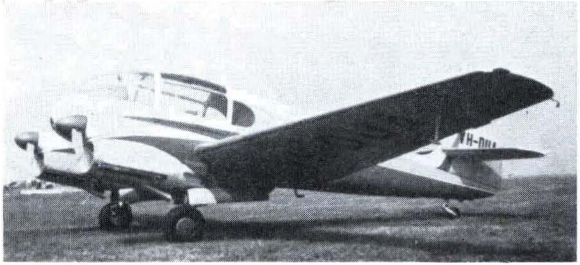
Nationality: American. **Type:** Crew Trainer. **Power Plants:** Two 2,500 h.p. Pratt and Whitney R-2800-99W radials. **Weight:** Loaded, 43,575 lb. **Performance:** Max. speed, 308 m.p.h.; initial climb, 1,370 ft./min. **Dimensions:** As for Convair CV-240.



CURTISS-WRIGHT C-46

The C-46, 3,180 of which were built during W.W.II, still serves with many air arms, the principal variants being the C-46A, D, E, and F. Many also serve with commercial concerns, primarily as freighters, and a number have been converted to take 2,100 h.p. Pratt and Whitney R-2800 engines, these including the Riddle C-46R and Smith Super 46-C (see page 297).

Nationality: American. **Type:** Military and Commercial Medium-range Transport. **Power Plants:** Two 2,000 h.p. Pratt and Whitney R-2800-51 or -75 radials. **Accommodation:** 30 passengers. **Weights:** Empty, 29,483 lb.; loaded, 45,000 lb. **Performance:** Max. speed, 241 m.p.h.; cruising, 227 m.p.h. **Dimensions:** Span, 108 ft. 1 in.; length, 76 ft. 4 in.; height, 21 ft. 9 in.; wing area, 1,360 sq. ft.



C.Z.L. AERO 145

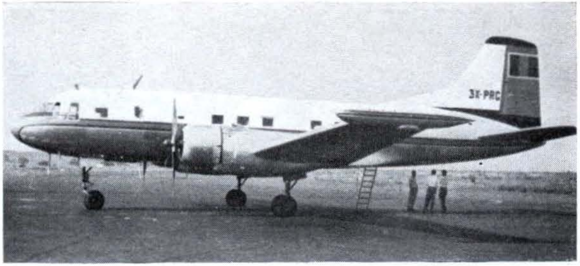
The Aero 145, manufactured by the C.Z.L. (Ceskoslovenské Závody Letecké), is a refined and more powerful development of the Super Aero 45 illustrated on the opposite page. The definitive development of the original Aero 45 which flew for the first time in July 1947, the Aero 145 was introduced in 1958.

Nationality: Czechoslovak. **Type:** Four/five-seat Light Transport. **Power Plants:** Two 140 h.p. Walter M-332 engines. **Weights:** Empty, 2,116 lb.; loaded, 3,527 lb. **Performance:** Max. speed, 175 m.p.h.; cruising, 160 m.p.h. at 3,800 ft.; initial climb, 860 ft./min.; service ceiling, 18,530 ft.; max. range (at econ. cruising), 942 mls.; single-engined climb, 350 ft./min.; single-engined ceiling, 6,300 ft. **Dimensions:** Span, 40 ft. 2½ in.; length, 25 ft. 6 in.; height, 7 ft. 6 in.; wing area, 184 sq. ft.

C.Z.L. AVIA-14 SUPER

The Avia-14 Super is a Czech-built development of the Russian Ilyushin Il-14M (see page 290) which has been manufactured as the Avia-14-32A. The Avia-14 Super features reduced structural weight, increased passenger accommodation, revised fuel tankage, the addition of wingtip tanks, and the installation of improved engines. The Avia-14 Super has been exported to several countries, that illustrated belonging to Guinea.

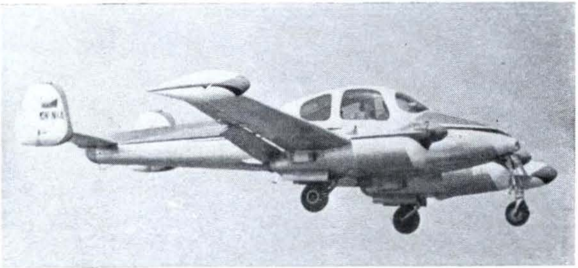
Nationality: Czechoslovak. **Type:** Medium-range Transport. **Power Plants:** Two 1,900 h.p. Shvetsov ASh-82T radials. **Accommodation:** 36–42 passengers. **Weights:** Empty, 27,668 lb.; max. loaded, 39,683 lb. **Performance:** Max. speed, 249 m.p.h. at 7,400 ft.; cruising, 186 m.p.h. **Dimensions:** Span, 106 ft. 8 in.; length, 73 ft. 2 in.; height, 25 ft. 7 in.; wing area, 1,076·39 sq. ft.



C.Z.L. L.200A MORAVA

Developed as a potential successor to the Super Aero 45, the Morava was initially flown with 160 h.p. Minor 6-III engines, and the first prototype flew on April 8, 1957. The Morava is in service with Aeroflot as a taxi aircraft, and a turboprop-powered version, the L.300, is currently under development. Some 120 Moravas had been built by the end of 1960.

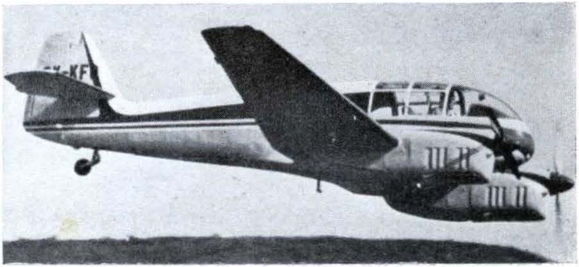
Nationality: Czechoslovak. **Type:** Five-seat Cabin Monoplane. **Power Plants:** Two 210 h.p. Walter M-337 engines. **Weights:** Empty, 2,811 lb.; max. loaded, 4,299 lb. **Performance:** Max. speed, 189 m.p.h. at 6,000 ft.; cruising, 180 m.p.h. at 8,200 ft.; initial climb, 1,260 ft./min.; service ceiling, 18,700 ft.; range, 1,025 mls. at 6,500 ft. **Dimensions:** Span, 39 ft. 4 in.; length, 28 ft. 3 in.; height, 7 ft. 4 in.; wing area, 186 sq. ft.

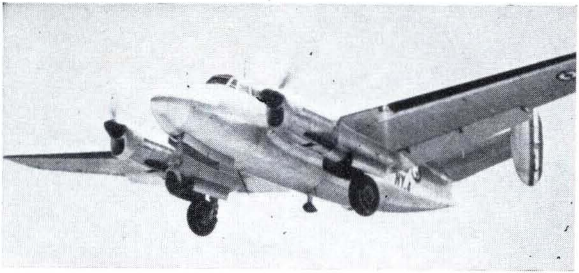


C.Z.L. SUPER AERO 45

Externally similar to the original Aero 45, the Super Aero 45 embodied numerous refinements and was exported in some numbers. One hundred and thirty were delivered to Aeroflot, and others were delivered to Brazil, Canada, France, India, Indonesia, Egypt and Switzerland. It is used by the Czech health service in the ambulance rôle.

Nationality: Czechoslovak. **Type:** Five-seat Light Transport. **Power Plants:** Two 105 h.p. Walter Minor 4-III engines. **Weights:** Empty, 2,112 lb.; loaded, 3,322 lb. **Performance:** Max. speed, 168 m.p.h.; cruising, 146 m.p.h.; initial climb, 755 ft./min.; service ceiling, 16,614 ft.; range, 871 mls. at 149 m.p.h., 1,088 mls. at 114 m.p.h. **Dimensions:** Span, 40 ft. 2½ in.; length, 25 ft. 6 in.; height, 7 ft. 6 in.; wing area, 184 sq. ft.

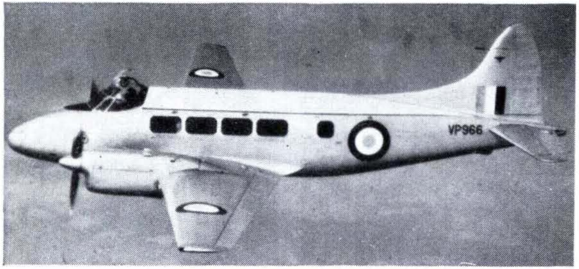




DASSAULT MD-315 FLAMANT

Designed as a multi-purpose aircraft, the Flamant was produced in several versions. The most important of these were the MD-311 bombing and navigational trainer with a glazed nose, thirty-nine of which were delivered to the Armée de l'Air; the MD-312 six-seat utility transport, 142 of which were built, and the MD-315 ten-seat transport, 137 of which were produced.

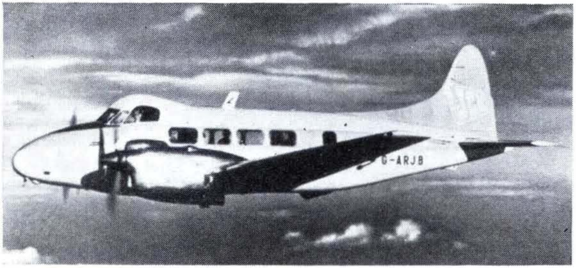
Nationality: French. **Type:** Light Military Transport. **Power Plants:** Two 580 h.p. SNECMA-Renault 12S 02-201 engines. **Accommodation:** 10 passengers. **Weights:** Empty, 9,350 lb.; loaded, 12,760 lb. **Performance:** Max. speed, 236 m.p.h.; cruising, 186 m.p.h.; initial climb, 984 ft./min.; ceiling, 26,240 ft.; range, 755 mls. **Dimensions:** Span, 67 ft. 10 in.; length, 41 ft.; height, 14 ft. 9 in.; wing area, 508 sq. ft.



DE HAVILLAND DEVON C.1

A military personnel transport adaptation of the civil Dove Series 4. Produced to specification C.13/46, the Devon was first supplied to the R.A.F. in 1948. The Sea Devon C.20 is the F.A.A. equivalent of the Devon C.1, and thirteen aircraft of this type were delivered. The Devon has been supplied to the R.N.Z.A.F., and the Dove serves with several air arms.

Nationality: British. **Type:** Light Military Personnel Transport. **Power Plants:** Two 340 h.p. de Havilland Gipsy Queen 70 engines. **Accommodation:** 6–8 passengers. **Weights:** Empty, 5,780 lb.; loaded, 8,500 lb. **Performance:** Max. speed, 210 m.p.h. at 8,000 ft.; cruising, 179 m.p.h.; initial climb, 750 ft./min.; range, 500 mls. **Dimensions:** Span, 57 ft.; length, 39 ft. 3 in.; height, 13 ft. 4 in.; wing area, 335 sq. ft.



DE HAVILLAND DOVE SRS. 8

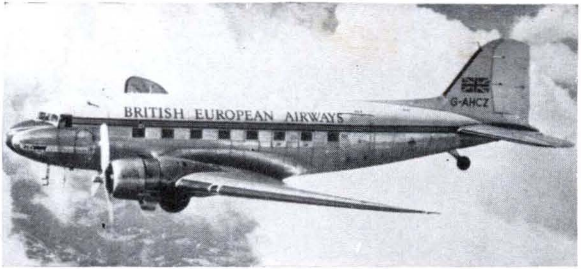
First flown on February 19, 1960, the Dove Srs.8 is the current production model of the basic D.H.104 which has been in continuous production since 1945. The Dove Srs. 8 differs from its immediate predecessor, the Srs. 6, in having a Heron-type high-dome canopy, exhaust thrust augmentation tubes, Gipsy Queen 70 Mk. 3s in place of the 380 h.p. Mk. 2s. The Dove Srs. 8 is known as the Dove Custom 800 in the U.S.A.

Nationality: British. **Type:** Light Transport and Executive Aircraft. **Power Plants:** Two 400 h.p. de Havilland Gipsy Queen 70 Mk. 3 engines. **Accommodation:** Six passengers. **Weights:** Empty, 6,580 lb.; loaded, 8,950 lb. **Performance:** Max. speed, 230 m.p.h.; cruising, 210 m.p.h. at 8,000 ft.; econ. cruising, 187 m.p.h.; initial climb, 1,420 ft./min. **Dimensions:** As for Devon.

DOUGLAS DC-3C (C-47A DAKOTA)

The DC-3C is a civil conversion of the wartime C-47A transport, differing from the original commercial DC-3A in having more powerful engines and strengthened airframe and undercarriage. A total of 194 commercial DC-3s were requisitioned by the U.S.A.A.F. in 1942 as C-48s, -49s, -50s, -51s, and -52s, and 10,926 C-47s were built in the U.S.A., more than 1,500 of these being currently in airline service.

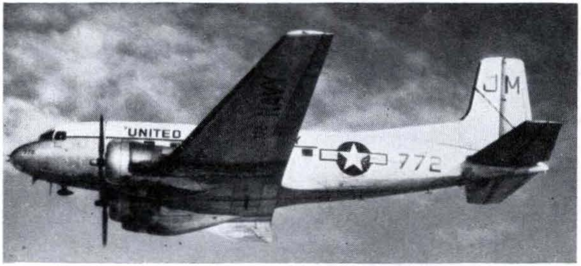
Nationality: American. **Type:** Short- and Medium-range Transport. **Power Plants:** Two 1,200 h.p. Pratt and Whitney R-1830-92 radials. **Accommodation:** 32–36 passengers. **Weights:** Empty, 17,720 lb.; loaded, 26,900 lb. **Performance:** Max. speed, 215 m.p.h.; cruising, 164 m.p.h. **Dimensions:** Span, 95 ft.; length, 64 ft. 6 in.; height, 16 ft. 11½ in.; wing area, 987 sq. ft.



DOUGLAS R4D-8

A substantial number of U.S. Navy R4D transports (equivalent to the U.S.A.F.'s C-47) were converted to R4D-8 standards by the installation of more powerful engines, the fitting of new wings, a new tail unit, and the modification of the undercarriage. The result of this conversion is virtually a new aeroplane, but proposals for similar commercial conversions did not meet with success.

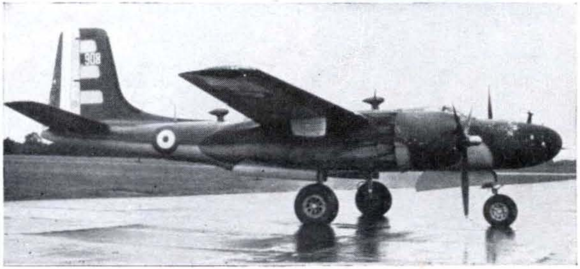
Nationality: American. **Type:** Medium-range Military Transport. **Power Plants:** Two 1,535 h.p. Wright R-1820-80 radials. **Weights:** Empty, 19,537 lb.; loaded, 31,000 lb. **Performance:** Max. speed, 270 m.p.h. at 5,900 ft.; cruising, 251 m.p.h. at 15,400 ft.; initial climb, 1,300 ft./min. **Dimensions:** Span, 90 ft.; length, 67 ft. 8½ in.; height, 18 ft. 3 in.; wing area, 969 sq. ft.

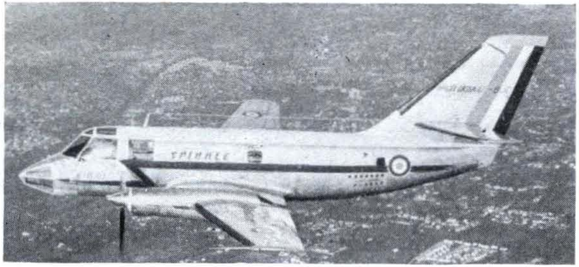


DOUGLAS B-26B INVADER

The B-26B Invader attack bomber currently serves with a number of air forces, including those of France (illustrated), Indonesia, Brazil, Dominica, Cuba, Peru and Saudi Arabia, and many have been converted as commercial executive transports, examples including the Lockheed Service Super 26 (page 292), the On Mark Marksman (page 294), the Rhodes Berry Silver Sixty (page 295) and the Smith Tempo II (page 297).

Nationality: American. **Type:** Attack Bomber. **Power Plants:** Two 2,000 h.p. Pratt and Whitney R-2800-79 radials. **Weights:** Empty, 23,275 lb.; loaded, 35,000 lb. **Performance:** Max. speed, 355 m.p.h.; cruising, 198 m.p.h.; initial climb, 2,030 ft./min.; range (4,000-lb. bombs), 1,360 mls. **Dimensions:** Span, 70 ft.; length, 49 ft. 11 in.; height, 18 ft. 6 in.; wing area, 540 sq. ft.

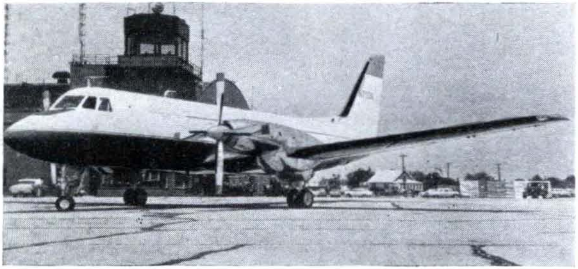




G.A.M. DASSAULT 410 SPIRALE

First flown on April 8, 1960, the Spirale is a non-pressurised military version of the M.D.415 Communauté and, in fact, uses many of the major components of the original Communauté prototype. For the close-support rôle, the Spirale may carry two 30-mm. cannon and six SS-11 missiles, four pods each housing eighteen 68-mm. missiles, or two missile pods and two 1,000-lb. bombs. It is also suited for ambulance and photo-reconnaissance.

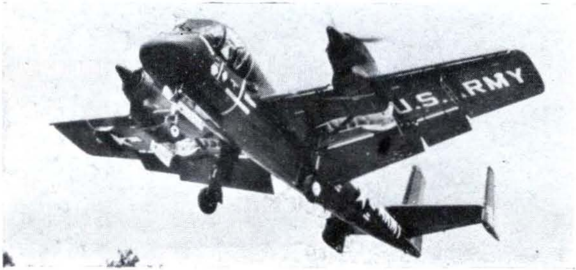
Nationality: French. **Type:** Multi-purpose Military Aircraft. **Power Plants:** Two 935 e.s.h.p. Turboméca Bastan turboprops. **Weight:** Loaded, 11,420–13,117 lb. **Performance:** Max. speed, 320 m.p.h.; max. cruising, 280 m.p.h. at 9,840 ft.; range (internal fuel), 1,554 mls. **Dimensions:** Span, 53 ft. 10¾ in.; length, 42 ft. 7¾ in.; height, 14 ft. 1¼ in.; wing area, 387·5 sq. ft.



GRUMMAN G-159 GULFSTREAM

Designed specifically for use as an executive transport, the Gulfstream flew for the first time on August 14, 1958, and some sixty aircraft of this type had been completed by the end of 1960. The basic structure can take 2,600 h.p. Dart R.Da.10 engines with which a 400 m.p.h. cruising speed is attainable.

Nationality: American. **Type:** Executive Transport and Feederliner. **Power Plants:** Two 2,105 e.h.p. Rolls-Royce Dart 529 turboprops. **Accommodation:** 10–19 passengers. **Weights:** Empty, 18,886 lb.; normal loaded, 31,000 lb.; max., 33,600 lb. **Performance:** Max. cruising speed, 357 m.p.h. at 25,000 ft.; normal cruising, 334 m.p.h.; initial climb (at 28,000 lb.), 3,010 ft./min.; max. range, 2,530 mls. **Dimensions:** Span, 78 ft. 4 in.; length, 63 ft. 8¼ in.; height, 22 ft. 10 in.; wing area, 610·3 sq. ft.



GRUMMAN AO-1 MOHAWK

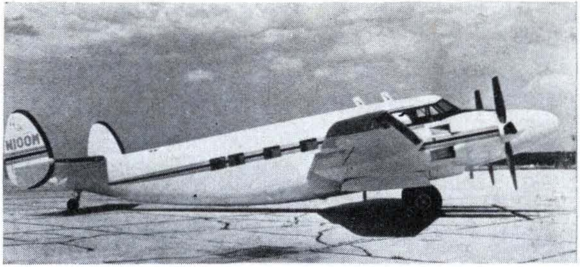
The Mohawk has been designed to meet a U.S. Army requirement for an S.T.O.L. front-line observation aircraft, and the first of nine YAO-1 service test aircraft flew on April 14, 1959. The first eighteen aircraft are AO-1AFs as will also be the second eighteen which will carry later equipment. These will be followed by seventeen AO-1BF Mohawks with side-looking radar, and twenty-four AO-1CFs with infra-red surveillance equipment.

Nationality: American. **Type:** Observation Aircraft. **Power Plants:** Two 1,005 e.s.h.p. Lycoming T53-L-3 turboprops. **Weights:** Empty, 9,028 lb.; loaded, 12,800 lb. **Performance:** Max. speed, 316 m.p.h.; cruising, 230 m.p.h.; initial climb, 3,000 ft./min. **Dimensions:** Span, 42 ft.; length, 41 ft.; height, 12 ft. 8 in.; wing area, 330 sq. ft.

HOWARD 500

Flown for the first time on March 15, 1960, the Howard 500 high-speed, pressurised transport is built around certain components of the Lockheed PV-1 patrol bomber, although all PV-1 components are extensively modified, and all systems are of entirely new design and manufacture. The Howard 500 has been evolved from the earlier Howard Super Ventura.

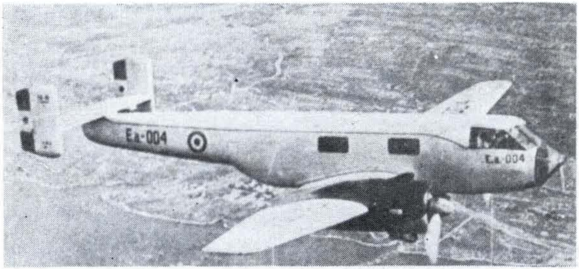
Nationality: American. **Type:** High-speed Executive Transport. **Power Plants:** Two 2,500 h.p. Pratt and Whitney R-2800-52W-M1 radials. **Accommodation:** 10–14 passengers. **Weights:** Empty, 21,700 lb.; loaded, 34,000 lb. **Performance:** Max. cruising speed, 350 m.p.h. at 21,000 ft.; initial climb, 2,550 ft./min.; max. cruising range, 2,800 mls. **Dimensions:** Span, 71 ft. 2 in.; length, 57 ft. 10 in.; height, 13 ft. 8½ in.; wing area, 592·22 sq. ft.



I.A.-35-I

The I.A.-35 general-purpose aircraft was first flown on September 21, 1953, and five basic versions have been produced for the Argentine Air Force. These are the I.A.-35-IA advanced trainer; -IB gunnery and bombing trainer; -II light transport; -III ambulance, and -IV photographic aircraft. An experimental development known as the Constancia II is being fitted with two Turboméca Bastan turboprops.

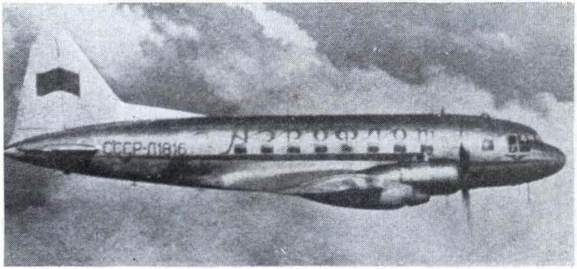
Nationality: Argentinian. **Type:** Military Multi-purpose Aircraft. **Power Plants:** Two 620 h.p. I.A.R.-19 El Indio radials. **Weights:** Empty, 7,717 lb.; loaded, 12,540 lb. **Performance:** Max. speed, 225 m.p.h.; max. cruising, 218 m.p.h. at 9,200 ft.; initial climb, 1,598 ft./min. **Dimensions:** Span, 64 ft. 3½ in.; length, 45 ft. 10½ in.; height, 12 ft. 2 in.; wing area, 452·084 sq. ft.

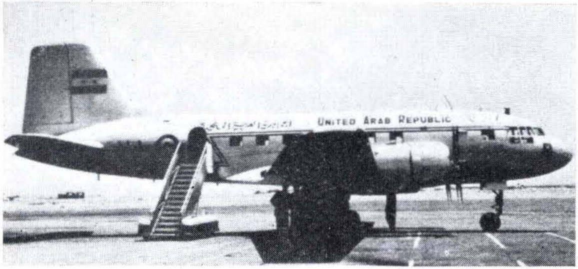


ILYUSHIN IL-12 (COACH)

Russia's first post-war production transport, the Il-12 flew as a prototype in 1945, and more than 3,000 examples of this aircraft were built in both civil and military versions. The military model is still used widely by the A.-V.D.V. and various Communist air forces, and a large number of Il-12A and Il-12B commercial transports are in use on internal routes.

Nationality: Russian. **Type:** Civil and Military Medium-range Transport. **Power Plants:** Two 1,775 h.p. Shvetsov ASh-82FNV radials. **Accommodation:** 18–27 passengers. **Weights:** Empty, 26,676 lb.; loaded, 38,030 lb. **Performance:** Max. speed, 252 m.p.h.; cruising, 205 m.p.h. at 6,500 ft.; initial climb, 900 ft./min.; range, 1,000 mls. at 200 m.p.h. **Dimensions:** Span, 104 ft.; length, 69 ft. 10 in.; height, 26 ft. 6 in.; wing area, 1,075 sq. ft.

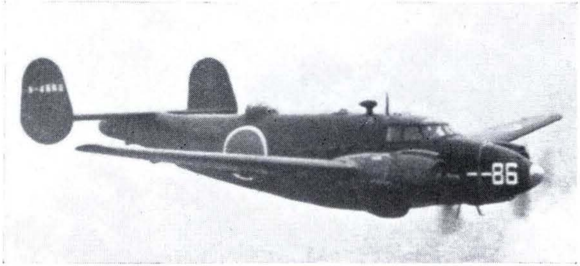




ILYUSHIN IL-14P (CRATE)

The Il-14 is a progressive development of the Il-12, and first appeared in 1953. The initial commercial model was the Il-14P described below, and in 1956 the Il-14M appeared, this being distinguished by an increase in fuselage length to 73 ft. 2 in., passenger capacity being increased to 24–28. The Il-14 has been built under licence in Czechoslovakia, East Germany and Poland.

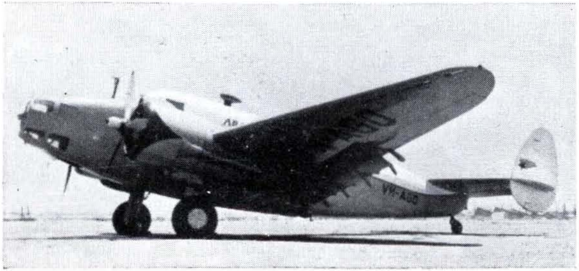
Nationality: Russian. **Type:** Medium-range Commercial Transport. **Power Plants:** Two 1,900 h.p. Shvetsov ASh-82T radials. **Accommodation:** 18-26 passengers. **Weights:** Empty, 26,600 lb.; loaded, 36,300 lb. **Performance:** Max. speed, 247 m.p.h.; cruising, 200 m.p.h. at 6,500 ft.; initial climb, 1,200 ft./min. **Dimensions:** Span, 104 ft.; length, 69 ft. 10 in.; height, 25 ft. 11 in.; wing area, 1,076·4 sq. ft.



LOCKHEED PV-2 HARPOON

Derived from the PV-1 Ventura and differing from the earlier type principally in having a redesigned tail assembly and increased wing span, the PV-2 still serves with the Peruvian Air Force and the Japanese Maritime Self-Defence Force, and a few remain with the French Navy in secondary rôles. A total of 535 Harpoons was produced for the U.S. Navy during the war years.

Nationality: American. **Type:** Maritime Reconnaissance Bomber. **Power Plants:** Two 2,000 h.p. Pratt and Whitney R-2800-31 radials. **Armament:** 4,000-lb bombs internally and 2,000-lb. bombs externally, plus five 0·5-in. guns. **Weights:** Empty, 21,010 lb.; loaded, 33,005 lb. **Performance:** Max. speed, 265 m.p.h.; cruising, 173 m.p.h. **Dimensions:** Span, 74 ft. 11⅞ in.; length, 52 ft. 1½ in.; height, 13 ft. 3 in.; wing area, 559·7 sq. ft.



LOCKHEED HUDSON III

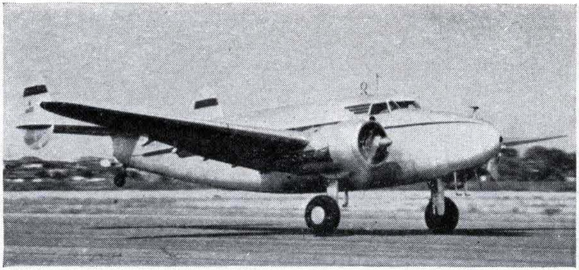
Evolved from the commercial Model 14 Super Electra which flew for the first time on July 29, 1937, the externally similar Model 414 was a reconnaissance-bomber which was supplied to the R.A.F. as the Hudson. A number of civil conversions of the Hudson III are flying as are also several Super Electras. Super Electras are flying with 750 h.p. Hornet S1E2-G, 760 h.p. Cyclone GR-1820-F62 and 820 h.p. GR-1820-G3B engines.

Nationality: American. **Type:** General-purpose Transport. **Power Plants:** Two 1,200 h.p. Wright Cyclone GR-1820-G205A radials. **Weights:** Empty, 12,929 lb.; loaded, 18,500 lb. **Performance:** Max. speed, 250 m.p.h.; cruising, 180 m.p.h.; initial climb, 2,215 ft./min. **Dimensions:** Span, 65 ft. 6 in.; length, 44 ft. 4 in.; height, 11 ft. 10½ in.; wing area, 551 sq. ft.

LOCKHEED 18-56 LODESTAR

A very considerable number of Model 18 Lodestar transports are flying in various parts of the world, the most widely used version being the Model 18-56 with 1,200 h.p. or 1,350 h.p. Cyclones. A number of modified executive transport versions of the Lodestar are flying. One modified model, Minnesota Air motive's Super Lodestar, has 1,300 h.p. R-1820-56A engines and is intended to cruise at 260 m.p.h. on 55% power at 7,000 ft.

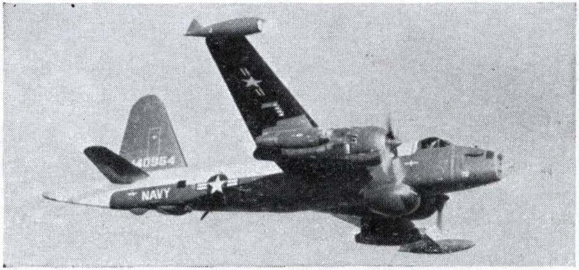
Nationality: American. **Type:** Commercial Transport. **Power Plants:** Two 1,000 h.p. Wright Cyclone 1820-G205A radials. **Accommodation:** 14 passengers. **Weights:** Empty, 11,790 lb.; loaded, 18,500 lb. **Performance:** Max. speed, 271 m.p.h.; cruising, 246 m.p.h. **Dimensions:** Span, 65 ft. 6 in.; length, 49 ft. 9⅞ in.; height, 11 ft. 10½ in.; wing area, 551 sq. ft.



LOCKHEED P2V-7 NEPTUNE

The Neptune has been in continuous production since April 1944, and production is currently scheduled to terminate during 1961. The most widely used model is the P2V-7 built under licence in Japan. A few serve with the U.S.A.F. as the RB-69.

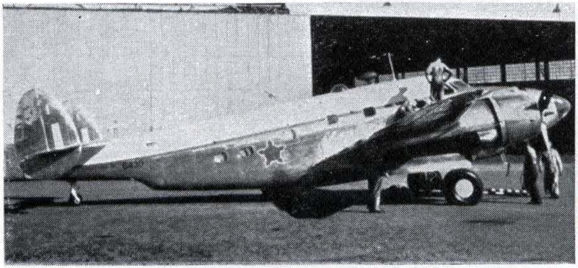
Nationality: American. **Type:** Maritime Reconnaissance Bomber. **Power Plants:** Two 3,500 h.p. Wright R-3350-32W Turbo Compound radials and two 3,400 lb.s.t. Westinghouse J34-WE-36 turbojets. **Weights:** Empty, 49,935 lb.; loaded, 79,895 lb. **Performance:** Max. speed, 403 m.p.h., (piston engines only), 356 m.p.h.; patrol speeds, 173–207 m.p.h. at 1,000 ft.; service ceiling, 22,000 ft.; max. range, 3,685 mls. **Dimensions:** Span, 103 ft. 10 in.; length, 91 ft. 8 in.; height, 29 ft. 4 in.; wing area, 1,000 sq. ft.

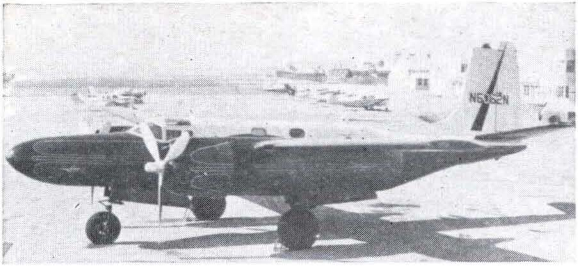


LOCKHEED PV-1 VENTURA

Produced as a military bomber development of the Model 18 Lodestar, the Vega 37 Ventura, or Model 237 PV-1 was employed by the U.S.A.F. as the B-34 and B-37, by the U.S. Navy as the PV-1, and by the R.A.F. and S.A.A.F. as the Ventura. The South African Air Force's Nos. 17 and 22 Squadrons currently employ the Ventura for transport, target-towing and photographic duties, and a number of civil conversions are flying.

Nationality: American. **Type:** Military General-pupose Aircraft and Commercial Transport. **Power Plants:** Two 2,000 h.p. Wright R-2600-31. **Weights:** Empty, 19,373 lb.; loaded, 26,500 lb. **Performance:** Max. speed, 315 m.p.h.; econ. cruising, 172 m.p.h.; max. range, 2,000 mls. **Dimensions:** Span, 65 ft. 6 in.; length, 51 ft. 7½ in.; height, 14 ft. 1⅜ in.; wing area, 619 sq. ft.

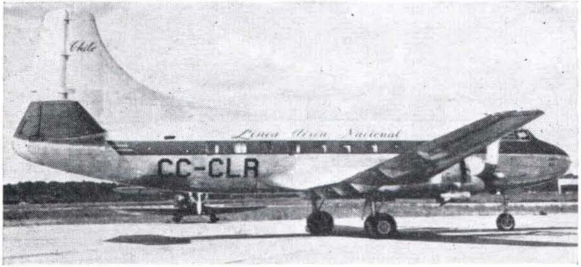




LOCKHEED AIR SERVICE SUPER 26

The Douglas B-26 Invader attack bomber (see page 287) is extremely popular as a basis for high-speed executive transport conversions, one of the latest of these being the Super 26 evolved by Lockheed Aircraft Service, Inc. The conversion involves the enlarging and strengthening of the entire fuselage, the installation of an air-stair door, the lengthening of the nose, and the provision of large windows.

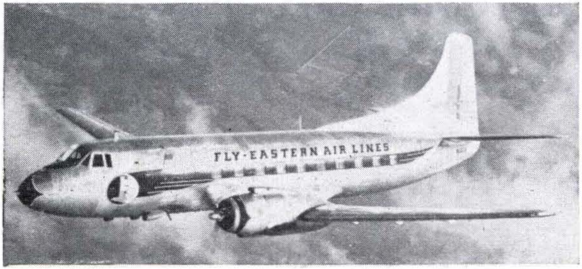
Nationality: American. **Type:** High-speed Executive Transport. **Power Plants:** Two 2,400 h.p. Pratt and Whitney R-2800 radials. **Accommodation:** 8–10 passengers. **Weights:** Empty, 24,892 lb.; loaded, 35,000 lb. **Performance:** Max. cruising speed, 375 m.p.h.; max. range, 2,500 mls. **Dimensions:** Span, 70 ft.; length, 50 ft. 9 in.; height, 18 ft. 6 in.; wing area, 596 sq. ft.



MARTIN 2-0-2

The first U.S. twin-engined transport of entirely post-war design, the Martin 2-0-2 was first flown on November 22, 1946. A total of forty-three transports of this type was built, twelve of these being Model 2-0-2As with 2,400 h.p. R-2800-CB16 engines, and twenty-one of these were still in airline service early in 1961.

Nationality: American. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Two 2,100 h.p. Pratt and Whitney R-2800-CA18 Double Wasp radials. **Accommodation:** 36–40 passengers. **Weights:** Empty, 25,086 lb.; loaded, 39,900 lb. **Performance:** Max. speed, 311 m.p.h. at 14,000 ft.; cruising, 286 m.p.h.; initial climb, 2,200 ft./min. **Dimensions:** Span, 93 ft. 3 in.; length, 71 ft. 4 in.; height, 28 ft. 5 in.; wing area, 864 sq. ft.



MARTIN 4-0-4

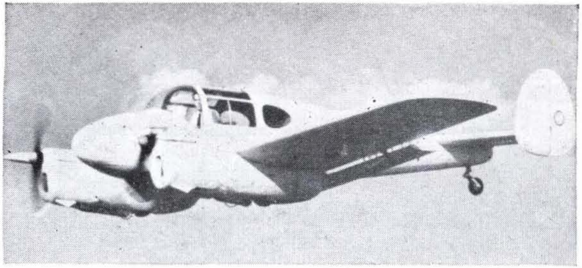
Derived from the Model 2-0-2, the Model 4-0-4 features a 39-in. increase in fuselage length, increased all-up weight and fuel capacity, and similar engines to those of the 2-0-2A. A total of 101 commercial 4-0-4s was built, plus two for the U.S. Coast Guard under the designation RM-1. Ninety were in airline service at the beginning of 1961, but early in that year, one of the two largest operators of this transport, T.W.A., retired its aircraft.

Nationality: American. **Type:** Short- and Medium-range Commercial Transport. **Power Plants:** Two 2,400 h.p. Pratt and Whitney R-2800-CB16 radials. **Accommodation:** 40 passengers. **Weights:** Empty, 27,799 lb.; loaded, 42,750 lb. **Performance:** Max. speed, 312 m.p.h.; cruising, 280 m.p.h. **Dimensions:** As for 2-0-2 except for length, 74 ft. 7 in.

MILES M.65 GEMINI 1A

The Gemini was evolved from the single-engined M.38 Messenger, and employs a similar fuselage and wing. The prototype was flown on October 26, 1945, and a considerable number of the 150 built are still flying, including several converted to 1A Special standard with 130 h.p. Lycoming O-290 engines. The Gemini 1, 1A, 1B and 4 have Cirrus Minors, and the 3, 3A, 3B and 7 have Gipsy Majors.

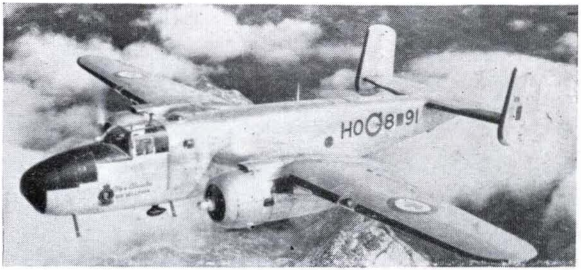
Nationality: British. **Type:** Four-seat Cabin Monoplane. **Power Plants:** Two 100 h.p. Blackburn Cirrus Minor 2 engines. **Weights:** Empty, 1,910 lb.; loaded, 3,000 lb. **Performance:** Max. speed, 145 m.p.h.; cruising, 135 m.p.h.; initial climb, 650 ft./min.; range, 820 mls. **Dimensions:** Span, 36 ft. 2 in.; length, 22 ft. 3 in.; height, 7 ft. 6 in.; wing area, 191 sq. ft.



NORTH AMERICAN B-25J MITCHELL

The most widely produced version of the Mitchell attack bomber was the B-25J, 4,318 examples of which were built between 1943 and 1945. A number of TB-25J trainer models (illustrated) serve with the R.C.A.F., and the B-25J remains first-line attack bomber equipment with several air arms, including those of Bolivia, Brazil, Chile, Indonesia, and Peru.

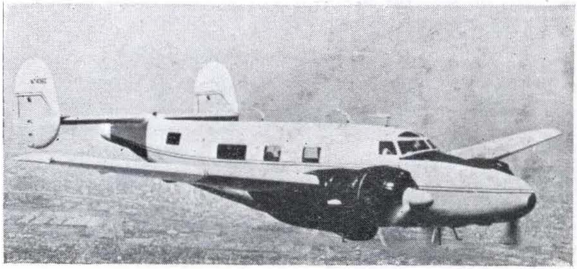
Nationality: American. **Type:** Attack Bomber. **Power Plants:** Two 1,850 h.p. Wright Cyclone R-2600-29 radials. **Armament:** Max. bomb load, 4,000 lb., plus thirteen 0·5-in. guns. **Weights:** Empty, 21,100 lb.; normal loaded, 33,500 lb. **Performance:** Max. speed, 275 m.p.h. at 15,000 ft.; cruising, 200 m.p.h.; initial climb, 1,110 ft./min. **Dimensions:** Span, 67 ft. 7 in.; length, 52 ft. 11 in.; height, 15 ft. 9 in.; wing area, 610 sq. ft.

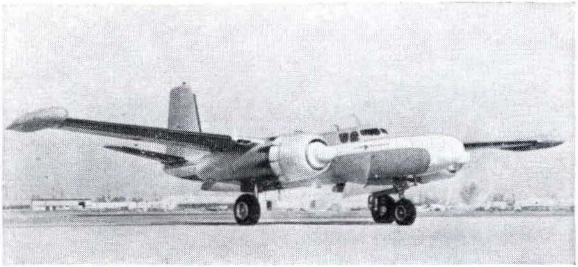


OAKLAND AIRMOTIVE CENTAURUS

The Centaurus is a business executive conversion of the PV-2 Harpoon (see page 290) embodying numerous engineering changes. Pressurisation is incorporated, large cabin windows are provided, the wings are modified, a new fuel system is provided and the fuselage contours are modified.

Nationality: American. **Type:** Executive Transport. **Power Plants:** Two 2,000 h.p. Pratt and Whitney R-2800-83-AM10 radials. **Accommodation:** 8–14 passengers. **Weights:** Empty, 18,700 lb.; loaded, 33,000 lb. **Performance:** Max. speed, 328 m.p.h. at sea level; cruising (55% power), 280 m.p.h. at 10,000 ft.; initial climb rate, 2,000 ft./min.; range, 2,000+ mls. **Dimensions:** Span, 74 ft.; length, 54 ft.; height, 16 ft.; wing area, 556 sq. ft.

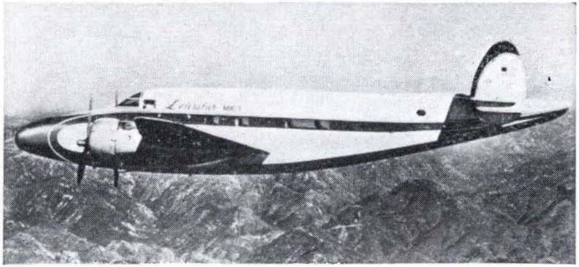




ON MARK MARKSMAN

The pressurised Marksman is a re-manufactured executive transport version of the B-26 Invader. Changes include the re-engineering of the fuselage in which large, DC-7-type cabin windows are inserted, and the provision of a new 103-in. combined radome and baggage compartment nose section. The model A has R-2800-75/79 engines; the Model B has R-2800-83AM-4A engines and 137 Imp. gal. wingtip tanks providing a range of 1,800 mls.

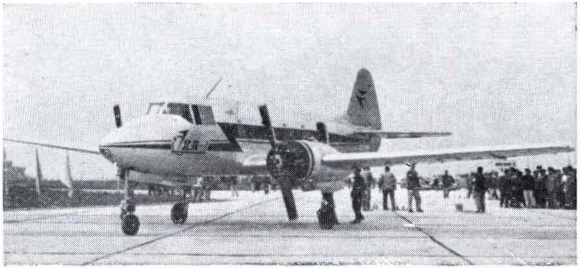
Nationality: American. **Type:** High-speed Executive Transport. **Power Plants:** Two 2,000 h.p. Pratt and Whitney R-2800-75/79 radials. **Accommodation:** 8 passengers. **Weights:** Empty, 24,000 lb.; loaded, 35,000 lb. **Performance:** Cruising, 325 m.p.h. at 16,000 ft.; initial climb, 1,700 ft./min. **Dimensions:** Not available.



PACAERO LEARSTAR MK. 1

The Learstar Mk. 1 is built around certain basic components of the Lockheed 18–56 Lodestar (see page 291), but all components are modified and all systems are entirely new. The Learstar first flew on May 19, 1954, and the first production aircraft followed on October 19th of that year. Many Learstar Mk. 1s have been delivered, and the Mk. 2 embodies the features of the Mk. 1 but the conversion does not disturb existing interiors.

Nationality: American. **Type:** Executive Transport. **Power Plants:** Two 1,425 h.p. Wright Cyclone R-1820-76A, -76B, or 86 radials. **Accommodation:** 8–12 passengers. **Weights:** Empty, 15,700 lb.; loaded, 24,000 lb. **Performance:** Max. speed, 321 m.p.h. **Dimensions:** Span, 66 ft. 2 in.; length, 51 ft.; height, 11 ft. 10 in.; wing area, 551 sq. ft.



PEKING NR.1

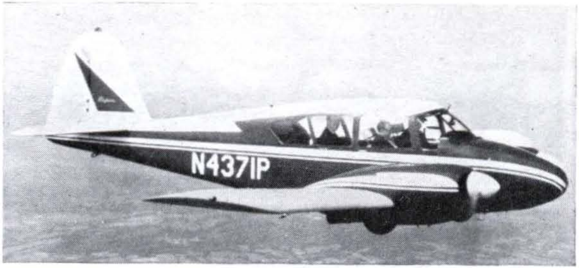
One of the first Chinese post-war aircraft of indigenous design, the Peking NR.1 was designed and built by students of the Peking Institute of Aeronautical Engineering, and has been designed for use on internal feederline services, operating from small and primitive airstrips. The prototype was first flown on September 24, 1958, but no details are currently available concerning the production status of the aircraft.

Nationality: Chinese. **Type:** Short-range Commercial Feederliner. **Power Plants:** Two 260 h.p. Ivchenko AI-14R radials. **Accommodation:** Eight passengers. **Weights:** No details available. **Performance:** Max. speed, 186 m.p.h.; normal range (at econ. cruising), 666 mls.; service ceiling, 15,750 ft. **Dimensions:** Span, 57 ft. 5 in.; length, 42 ft. 7¾ in.

PIPER PA-23-160 APACHE G

Originally known as the Twin-Stinson, the Apache flew for the first time on March 2, 1952, production deliveries commencing early in 1953. The Apache has since been in continuous production, the current model being the Apache G which embodies various refinements.

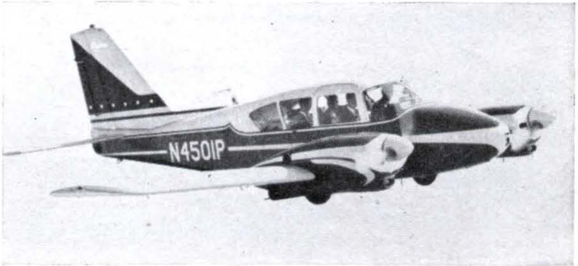
Nationality: American. **Type:** Four/five-seat Cabin Monoplane. **Power Plants:** Two 160 h.p. Lycoming 0-320-B engines. **Weights:** Empty, 2,280 lb.; loaded, 3,800 lb. **Performance:** Max. speed, 183 m.p.h.; cruising (75% power), 173 m.p.h. at 7,000 ft.; initial climb, 1,260 ft./min.; service ceiling, 17,000 ft.; normal range, 840 mls.; range with max fuel, 1,260 mls. **Dimensions:** Span, 37 ft.; length, 27 ft. 1½ in.; height, 9 ft. 6 in.; wing area, 204 sq. ft.



PIPER PA-23-250 AZTEC (UO-1)

The Aztec, flown for the first time early in 1959, is a development of the Apache, and employs the proven systems and many components of the earlier aircraft. Deliveries of the Aztec began in 1960, and twenty have been delivered to the U.S. Navy as communications monoplanes under the designation UO-1.

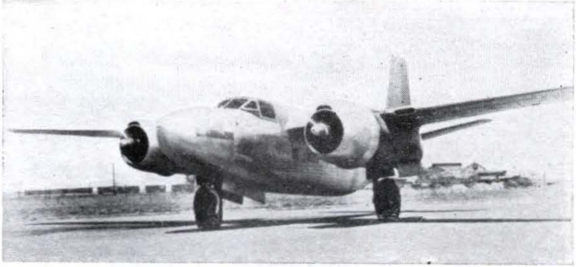
Nationality: American. **Type:** Five-seat Cabin Monoplane. **Power Plants:** Two 250 h.p. Lycoming O-540 engines. **Weights:** Empty, 2,775 lb.; loaded, 4,800 lb. **Performance:** Max. speed, 215 m.p.h.; cruising (75% power), 205 m.p.h. at 7,000 ft., (65% power), 200 m.p.h. at 9,000 ft.; normal range, 1,200 mls. at 200 m.p.h.; max. range (45% power), 1,400 mls.; initial climb, 1,650 ft./min.; service ceiling, 22,500 ft. **Dimensions:** Span, 37 ft.; length, 27 ft. 7¼ in.; height, 10 ft. 3½ in.; wing area, 207 sq. ft.

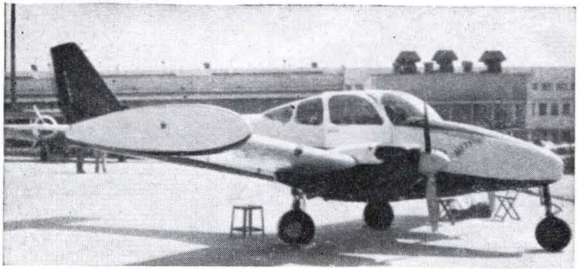


RHODES BERRY SILVER SIXTY

The Silver Sixty, flown for the first time in the summer of 1960, is an executive transport conversion of the B-26 Invader in which the lower half of the original fuselage is removed and replaced by a deeper equivalent so that 6 ft. 6 in. cabin headroom is attained without change to the original wing spar structure. A cargo version is proposed with a drop-down loading ramp in the rear fuselage. R-2800-CB16 engines of 2,400 h.p. can be fitted to produce a cruising speed of 365 m.p.h.

Nationality: American. **Type:** High-speed Executive Transport. **Power Plants:** Two 2,000 h.p. Pratt and Whitney R-2800-27 or -79 radials. **Accommodation:** 12–14 passengers. **Weight:** Loaded, 35,000 lb. **Performance:** Max. cruising speed, 305 m.p.h. **Dimensions:** Span, 70 ft. No further details available.

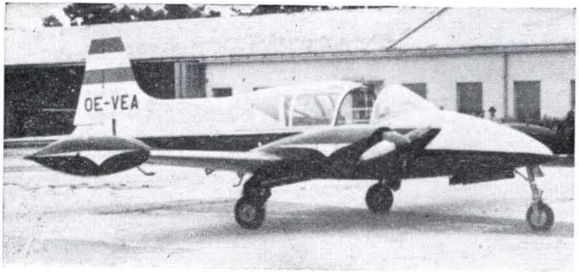




SATURN METEOR II

The Meteor II, flown for the first time in 1960, was evolved by Saturn Aircraft Engineering from the Monocoupe Meteor tested by the former Monocoupe concern in 1954. The new Meteor differs from its predecessor in a number of respects and makes extensive use of reinforced plastics for the nose, tail surfaces, engine cowlings and tip tanks. Production models are to have 204 b.h.p. fuel-injection Lycoming engines.

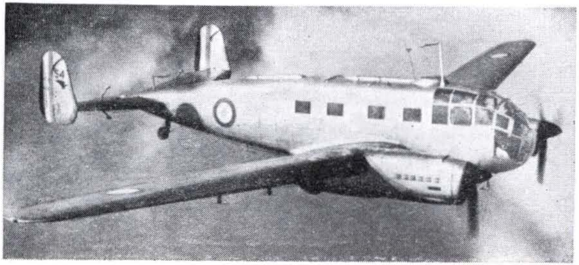
Nationality: American. **Type:** Five-seat Cabin Monoplane, **Power Plants:** Two 180 h.p. Lycoming O-360-A1A engines. **Weights:** Empty, 2,150 lb.; loaded, 3,800 lb. **Performance**; Max. speed, 210–215 m.p.h.; cruising (75% power), 199 m.p.h., range (at econ. cruising), 1,100 mls. **Dimensions:** Span, 36 ft.; length, 28 ft.; height, 7 ft.; wing area, 180·1 sq. ft.



S-G-P M.222 FLAMINGO

The Flamingo, developed by the Simmering-Graz-Pauker A.G., was flown for the first time on May 15, 1959, a second prototype following in 1960. The Flamingo is of mixed construction with wooden laminar-flow wings and a steel-tube fuselage with light alloy and laminated plastic skinning.

Nationality: Austrian. **Type:** Four-seat Cabin Monoplane. **Power Plants:** Two 150 h.p. Lycoming O-320-A engines. **Weights:** Empty, 2,310 lb.; loaded, 3,850 lb. **Performance:** Max. speed, 186 m.p.h. at sea level; cruising (75% power), 168. m.p.h. at sea level; initial climb, 1,380 ft./min.; service ceiling, 21,000 ft.; range, 745 mls. at 6,560 ft.; endurance, 4 hr. 18 min, (at econ. cruising). **Dimensions:** Span, 36 ft. 1 in.; length 28 ft. 6½ in.; height, 10 ft. 4 in.; wing area, 184 sq. ft.



SIEBEL SI 204D

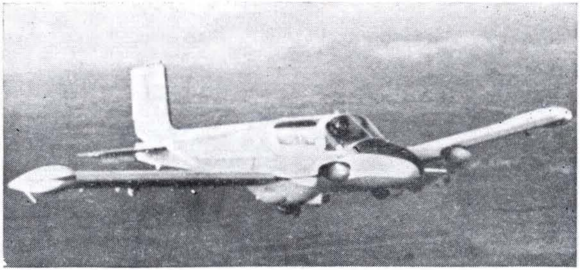
Evolved in 1941 from the Si 204A (two 360 h.p. Argus As 410s) the Si 204D was manufactured in large numbers during W.W. II as a Luftwaffe crew trainer. Production was initiated at the former Hanriot (later S.N.C.A. du Centre) plant in France where production continued in the post-war years, 350 being built as the N.C.701 and 702 Martinet (the latter having a stepped cockpit). It was also built in Czechoslovakia as the C.3.

Nationality: German. **Type:** Crew Trainer and Light Transport. **Power Plants:** Two 575 h.p. Argus As 411 engines. **Weights:** Empty, 8,639 lb.; loaded, 11,902 lb. **Performance:** Max. speed, 219 m.p.h. at 9,840 ft.; cruising, 185 m.p.h.; normal range, 500 mls., max., 1,243 mls. **Dimensions:** Span, 69 ft. 9 in.; length, 39 ft. 5 in.; height, 13 ft. 9½ in.; wing area, 495·14 sq. ft.

SIPAVIA S.261 ANJOU

The S.261 Anjou was flown for the first time on July 24, 1959, having been developed from the B.260 originally designed and built by the Société Boisavia. A proposed development of the basic design was the S.262 six-seater with 250 h.p. Lycoming O-540 engines. The Anjou is of welded steel-tube construction with metal and fabric covering.

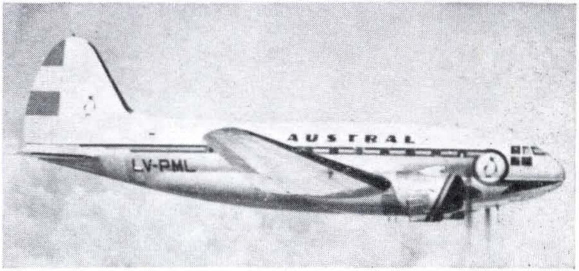
Nationality: French. **Type:** Four-seat Cabin Monoplane. **Power Plants:** Two 180 h.p. Lycoming O-360-A1A engines. **Weights:** Empty, 2,751 lb.; loaded, 4,520 lb. **Performance:** Max. speed, 191 m.p.h.; max. cruising, 167 m.p.h.; initial climb, 1,161 ft./min.; service ceiling, 14,764 ft.; range (at economical cruising speed), 656 mls. **Dimensions:** Span, 43 ft. 11½ in.; length, 26 ft. 3 in.; height, 12 ft. 2½ in.; wing area, 231·424 sq. ft.



SMITH SUPER 46-C

The Super 46-C is a conversion of the basic Curtiss C-46 (see page 284) to offer substantially improved performance and economy, and more than 100 C-46s have been converted to Super 46-C standards. A basically similar conversion by Riddle Airlines is known as the Riddle C-46R. Similarly powered to the Super 46-C, the C-46R-1 has metal ailerons; the C-46R-5 has fabric-covered ailerons and hydraulic boost, and the C-46R-10 is the R-5 with metal ailerons similar to the R-1.

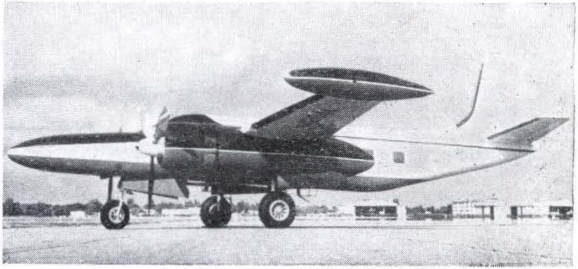
Nationality: American. **Type:** Commercial Passenger and Freight Transport. **Power Plants:** Two 2,100 h.p. Pratt and Whitney R-2800C. **Weights:** Empty, 29,050 lb.; loaded, 50,650 lb. **Performance:** Cruising, 234 m.p.h. at 10,000 ft. **Dimensions:** Span, 108 ft. 1 in.; length, 76 ft. 4 in.; height, 21 ft. 9 in.

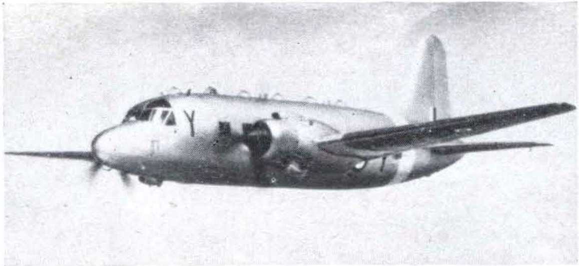


SMITH TEMPO II

Another extensively modified version of the B-26 Invader for executive transport use, the Tempo II produced by the L. B. Smith Aircraft Corporation has redesigned wing attachments which free the cabin of the original wing spar structure and result in an increased wing span. The flight deck has been completely redesigned. The Tempo I is the unpressurised model.

Nationality: American. **Type:** High-speed Executive Transport. **Power Plants:** Two 2,100 h.p. Pratt and Whitney R-2800C radials. **Accommodation:** Ten passengers. **Weight:** Loaded, 35,000 lb. **Performance:** Cruising speed (67% power), 350 m.p.h. at 20,000 ft.; initial climb, 1,650 ft./min.; service ceiling, 29,600 ft.; range, 2,400 mls. **Dimensions:** Span, 73 ft. 5½ in.; length, 60 ft. 3½ in.; height, 20 ft.; wing area, 569 sq. ft.

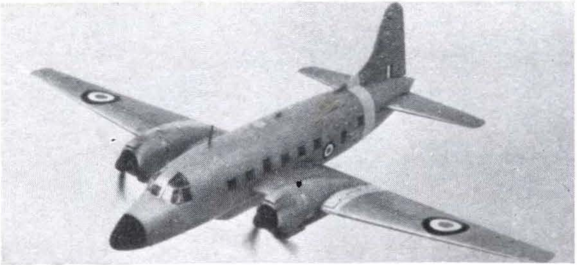




VICKERS VALETTA C.1

The Valetta military transport was derived from the commercial Viking 1B, differing in having a strengthened freight floor, a loading door in the fuselage port side, and more powerful engines. The Valetta C.1 first flew on June 30, 1947, and variants include the C.2, a V.I.P. version with increased tankage; the T.3 (illustrated) navigational trainer, and the T.4 radar trainer with an elongated nose.

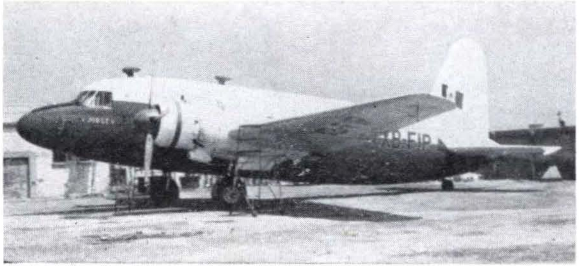
Nationality: British. **Type:** Medium-range Military Transport. **Power Plants:** Two 1,975 h.p. Bristol Hercules 230 radials. **Weights:** Empty, 24,854 lb.; loaded, 36,500 lb. **Performance:** Max. speed, 294 m.p.h.; cruising, 172 m.p.h.; range (34 troops), 360 mls., (20 troops), 530 mls. **Dimensions:** Span, 89 ft. 3 in.; length, 62 ft. 11 in.; height, 19 ft. 6 in.; wing area, 882 sq. ft.



VICKERS VARSITY T.1

Evolved from the Valetta transport, the Varsity T.1 crew trainer was flown on July 17, 1949, important differences between the transport and the trainer being the nosewheel undercarriage and ventral pannier of the latter. One hundred and sixty-three Varsities had been built when production terminated in February 1954, and one Varsity serves with the Swedish Air Force.

Nationality: British. **Type:** Advanced Crew Trainer. **Power Plants:** Two 1,950 h.p. Bristol Hercules 264 radials. **Weights:** Empty, 27,040 lb.; loaded, 37,500 lb. **Performance:** Max. speed, 288 m.p.h. at 10,000 ft.; cruising, 239 m.p.h.; initial climb, 1,400 ft./min.; service ceiling, 28,700 ft.; max. range, 2,648 mls. **Dimensions:** Span, 95 ft. 7 in.; length, 67 ft. 6 in.; height, 23 ft. 11 in.; wing area, 974 sq. ft.



VICKERS VIKING 1B

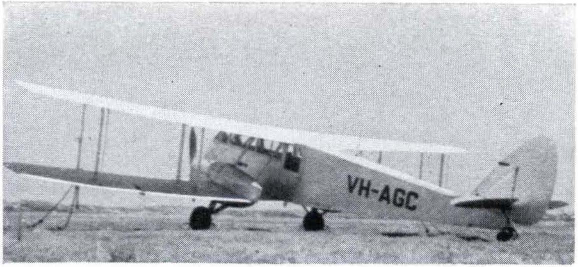
The first British post-war commercial transport, the Viking first flew on June 22, 1945, and of the 166 examples built, sixty-five were in airline service at the beginning of 1961. Whereas the Viking 1A has Hercules 630 engines, the Vikings 1B and 2 have Hercules 634s of similar power. Aircraft modified by Eagle Aircraft Services are known as Vikings 3, 3A, 3B and 4, the modifications being primarily to the engine cooling system.

Nationality: British. **Type:** Medium-range Transport. **Power Plants:** Two 1,690 h.p. Bristol Hercules 634 radials. **Accommodation:** 24–38 passengers. **Weights:** Empty, 23,250 lb.; loaded, 34,000 lb. **Performance:** Max. speed, 263 m.p.h.; cruising, 210 m.p.h.; initial climb, 1,274 ft./min. **Dimensions:** Span, 89 ft. 3 in.; length, 65 ft. 2 in.; height, 19 ft. 6 in.; wing area, 882 sq. ft.

DE HAVILLAND D.H.84 DRAGON 2

The Dragon was first flown on November 12, 1932, and 115 had been built in the U.K. when production terminated in 1936. The tools were later shipped to Australia where eighty-seven Dragons were built as navigational trainers during the war years. Several Australian-built Dragons are still flying as freighters and feederliners.

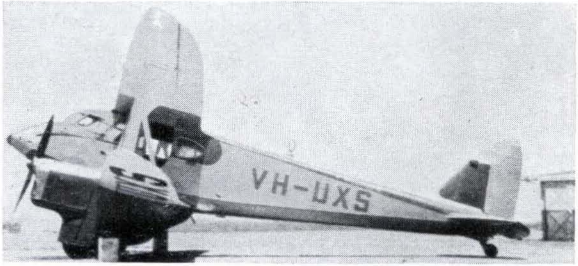
Nationality: British. **Type:** Light Transport. **Power Plants:** Two 130 h.p. de Havilland Gipsy Major engines. **Accommodation:** Six passengers. **Weights:** Empty, 2,336 lb.; loaded, 4,500 lb. **Performance:** Max. speed, 134 m.p.h.; cruising, 114 m.p.h.; initial climb, 565 ft./min.; ceiling, 14,500 ft.; range, 545 mls. **Dimensions:** Span, 47 ft. 4 in.; length, 34 ft. 6 in.; height, 10 ft. 1 in.; wing area, 376 sq. ft.



DE HAVILLAND D.H.90 DRAGONFLY

Only five of the sixty-six Dragonflies built during 1936–8 are currently flying, the majority of these operating in Australasia. The Dragonfly flew for the first time in September 1935, and was intended as a multi-seat private-owner type, but it was subsequently used primarily as a charter type and feederliner. The Dragonfly is of wooden construction.

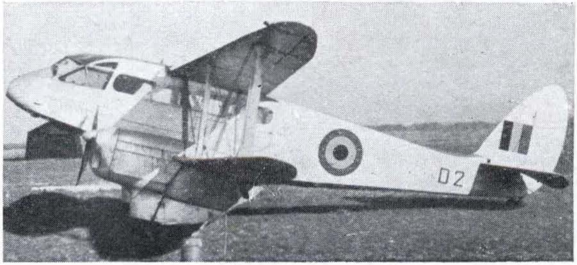
Nationality: British. **Type:** Five-seat Cabin Biplane. **Power Plants:** Two 130 h.p. de Havilland Gipsy Major engines. **Weights:** Empty, 2,500 lb.; loaded, 4,000 lb. **Performance:** Max. speed, 144 m.p.h. at sea level; cruising, 127 m.p.h. at 1,000 ft.; initial climb, 875 ft./min.; ceiling, 18,100 ft.; range, 625 mls. **Dimensions:** Span, 43 ft.; length, 31 ft. 8 in.; height, 9 ft. 2 in.; wing area, 288 sq. ft.

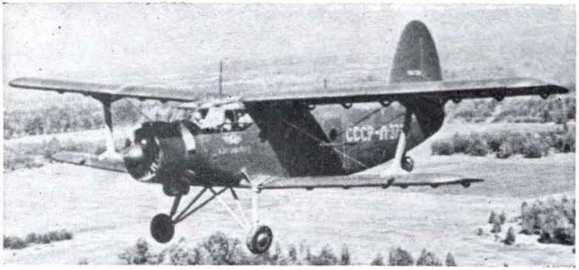


DE HAVILLAND D.H.89A DRAGON RAPIDE 4

First flown in April 1934, the Dragon Rapide remained in continuous production until 1946 when 737 aircraft of this type had been built of which 108 were in airline service at the beginning of 1961. Gipsy Queen 2 engines have replaced the Gipsy Queen 3s in most Dragon Rapides, this forming the Mk. 4. A large number were used by the R.A.F. as Dominie trainers.

Nationality: British. **Type:** Light Commercial Transport. **Power Plants:** Two 200 h.p. de Havilland Gipsy Queen 2 engines. **Accommodation:** 6–8 passengers. **Weights:** Empty, 3,230 lb.; loaded, 6,000 lb. **Performance:** Max. speed, 150 m.p.h.; cruising, 140 m.p.h.; initial climb, 1,200 ft./min.; service ceiling, 16,000 ft.; range, 520 mls. **Dimensions:** Span, 48 ft.; length, 34 ft. 6 in.; height, 10 ft. 3 in.; wing area, 336 sq. ft.

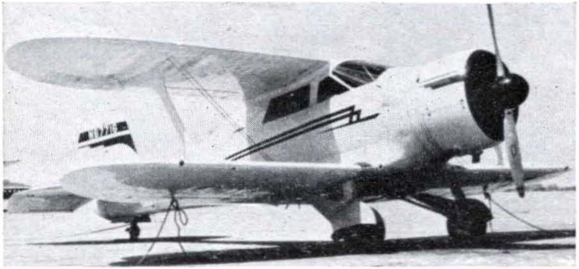




ANTONOV AN-2 (COLT)

One of the very few post-war biplanes, the An-2 is employed extensively in the Soviet Union as a light freighter and feederliner, and in agricultural rôles. A twin-float seaplane model is designated An-2V. Manufactured under licence in China, the An-2 has been exported widely. The prototype was flown for the first time in 1947 with a 630 h.p. ASh-21 engine.

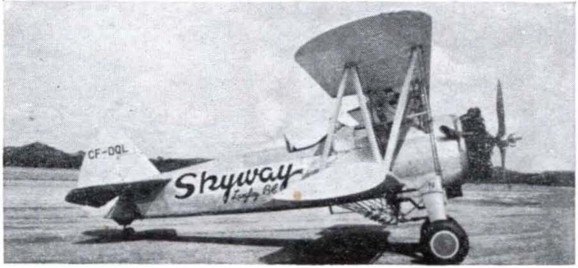
Nationality: Russian. **Type:** Light Transport Biplane. **Power Plant:** One 1,000 h.p. Shvetsov ASh-62IR radial. **Accommodation:** 10–14 passengers. **Weights:** Empty, 7,275 lb.; normal loaded, 11,574 lb. **Performance:** Max. speed, 161 m.p.h.; cruising, 124 m.p.h.; range (max. payload), 559 mls., (1,650-lb. payload), 1,087 mls.; ceiling, 16,400 ft. **Dimensions:** Span, 59 ft. 7½ in.; length, 42 ft.; height, 13 ft. 7½ in.; wing area, 769·61 sq. ft.



BEECH MODEL 17

Introduced in the early 'thirties, the Model 17 was produced in large numbers and numerous models, but all variants are externally similar, and feature the unusual backward stagger of the wings. A large number of these four-seat biplanes are flying, the most common of these being the D17S (illustrated). The B17, C17 and E17 are powered by the 285 h.p. Jacobs L-5, the F17 has the 330 h.p. Jacobs, and the D17A and D17R have the 350 and 450 h.p. Wright Whirlwind respectively.

Nationality: American. **Type:** Four-seat Cabin Biplane. **Power Plant:** One 450 h.p. Pratt and Whitney R-985 radial. **Weights:** Empty, 2,460 lb.; loaded, 4,200 lb. **Performance:** Max. cruising speed, 202 m.p.h.; range, 700 mls. **Dimensions:** Span, 32 ft.; length, 26 ft.; height, 8 ft. 2 in.; wing area, 296 sq. ft.



BOEING-STEARMAN MODEL 75

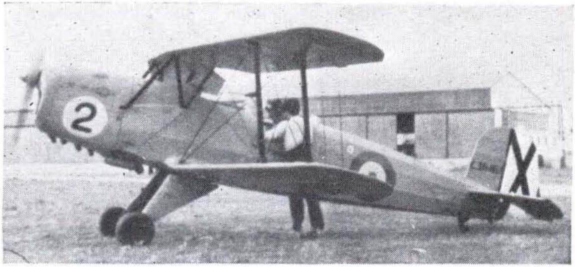
No less than 10,346 Model 75 biplanes were produced during World War II for the U.S.A.A.F. as the PT-13, PT-17 and PT-18, and for the U.S. Navy as the N2S-1, -2, and -3. Several thousand of these are still active, being extensively used by Latin-American air arms as primary trainers, and as agricultural aircraft such as that illustrated. The most widely used model is the A75N1 described by the specification.

Nationality: American. **Type:** Two-seat Primary Trainer and General-purpose Biplane. **Power Plant:** One 220 h.p. Continental W-670 radial. **Weights:** Empty, 1,936 lb.; loaded, 2,717 lb. **Performance:** Max. speed, 124 m.p.h.; cruising, 106 m.p.h., range, 505 mls.; initial climb, 840 ft./min. **Dimensions:** Span; 32 ft. 2 in.; length, 25 ft.; height, 9 ft. 2 in.; wing area, 297·4 sq. ft.

BÜCKER BÜ 131 JUNGMANN

Designed by the Bücker Flugzeugbau in 1933, the Jungmann was built in some numbers prior to W.W. II for both the Luftwaffe and private owners. During the war production was transferred to the Aero plant in Czechoslovakia where deliveries continued into the post-war years as the C.4 and C.104. Licence manufacture began in Spain in 1939, 150 being built by C.A.S.A. which concern resumed production with a further fifty in 1956. One hundred were also built in Switzerland by the Dornier-Werke A.G.

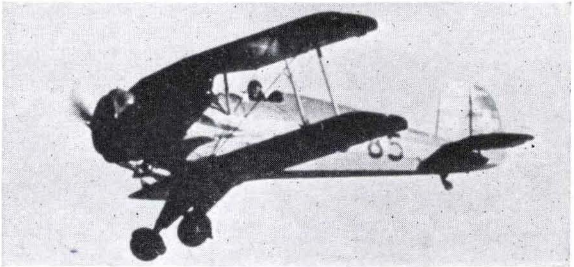
Nationality: German. **Type:** Primary Trainer. **Power Plant:** One 100 h.p. Hirth HM.504. **Weights:** Empty, 836 lb.; loaded, 1,474 lb. **Performance:** Max. speed, 115 m.p.h. **Dimensions:** Span, 24 ft. 3 in.; length, 21 ft. 8 in.; height, 7 ft. 5 in.; wing area, 145 sq. ft.



BÜCKER BÜ 133 JUNGMEISTER

The Jungmeister was first produced in 1935, and was subsequently built with several types of engine, the most widely used being the Siemens Sh 14A-4. Production of the Jungmeister was undertaken by C.A.S.A. in Spain under licence, and forty-seven examples were built in Switzerland by the Dornier-Werke A.G. A number of Jungmeisters are flying in Spain and Switzerland.

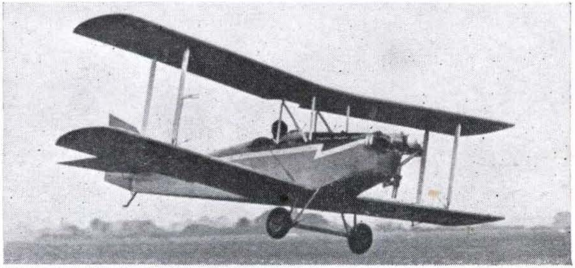
Nationality: German. **Type:** Advanced Single-seat Aerobatic Trainer. **Power Plant:** One 160 h.p. Siemens Sh 14A-4 radial. **Weights:** Empty, 925 lb.; loaded, 1,290 lb. **Performance:** Max. speed, 134 m.p.h.; cruising, 125 m.p.h.; range, 310 mls.; time to 3,280 ft., 2·8 min., to 6,560 ft., 6·3 min.; ceiling, 20,000 ft. **Dimensions:** Span, 21 ft. 7½ in.; length, 19 ft. 4 in.; height, 7 ft. 4½ in.; wing area, 130 sq. ft.

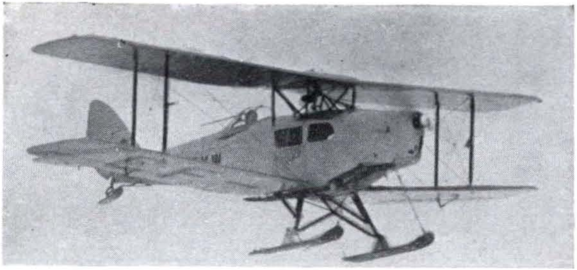


CURRIE WOT

The ultra-light Wot was originally designed by J. R. Currie in 1937, and two examples have been built by the Hampshire Aeroplane Club, the first of these, powered by a 35 h.p. Aeronca-J.A.P. engine, flying for the first time on September 11, 1958. The second Wot was fitted with a 60 h.p. Walter Mikron which was subsequently replaced by a 60 s.h.p. Rover TP/60/1 gas turbine. The specification relates to the J.A.P.-powered Wot.

Nationality: British. **Type:** Single-seat Ultra-light Biplane. **Power Plant:** One 35 h.p. Aeronca-J.A.P. engine. **Weights:** Empty, 530 lb.; loaded, 740 lb. **Performance:** Max. speed, 82 m.p.h.; cruising, 76 m.p.h.; initial climb, 350 ft./min. **Dimensions:** Span, 22 ft. 1 in.; length, 18 ft. 9 in.; height, 6 ft. 9 in.; wing area, 145 sq. ft.

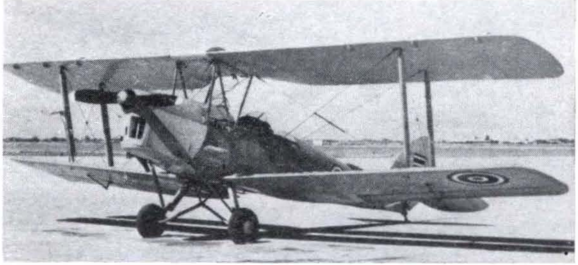




DE HAVILLAND D.H.83 FOX MOTH

The Fox Moth, first flown in March 1932, employed the undercarriage, wings, tail unit and engine mounting of the D.H.82 Tiger Moth, these components being married to a new fuselage with an enclosed cabin for four passengers. Ninety-eight Fox Moths were built in the U.K., and in 1945, the Canadian branch of the company built a further fifty as the D.H.83C (illustrated) with an enclosed cockpit for the pilot.

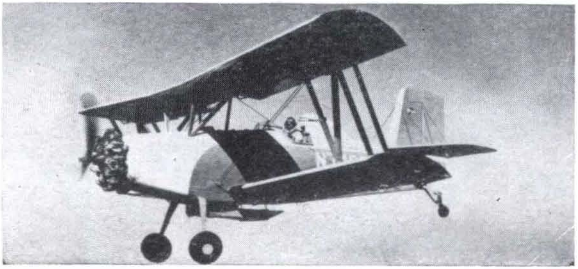
Nationality: British. **Type:** Five-seat Utility Biplane. **Power Plant:** One 140 h.p. de Havilland Gipsy Major IC engine. **Weights:** Empty, 1,219 lb.; loaded, 2,100 lb. **Performance:** Max. speed, 110 m.p.h.; cruising, 96 m.p.h.; initial climb, 525 ft./min.; service ceiling, 10,500 ft. **Dimensions:** Span, 30 ft. 10⅝ in.; length, 25 ft. 9 in.; height, 8 ft. 4¾ in.; wing area, 247 sq. ft.



DE HAVILLAND D.H.82 TIGER MOTH

Originally known as the D.H.60T, the Tiger Moth appeared in the early summer of 1931, and as the D.H.82A was built in extremely large numbers as a primary trainer during W.W. II. In the U.K., 4,005 were built for the R.A.F., 1,747 were built in Canada, 1,085 were built in Australia, and 345 were built in New Zealand. The accompanying photograph illustrates a Tiger Moth of the Thai Air Force, and a four-seat cabin conversion, the Thruxton Jackaroo, is illustrated on the opposite page.

Nationality: British. **Type:** Two-seat Primary Trainer. **Power Plant:** One 130 h.p. de Havilland Gipsy Major engine. **Weights:** Empty, 1,115 lb.; loaded, 1,825 lb. **Performance:** Max. speed, 109 m.p.h.; cruising, 90 m.p.h. **Dimensions:** Span, 29 ft. 4 in.; length, 23 ft. 11 in.; height, 8 ft. 9½ in.; wing area, 239 sq. ft.



GRUMMAN G-164 AG-CAT

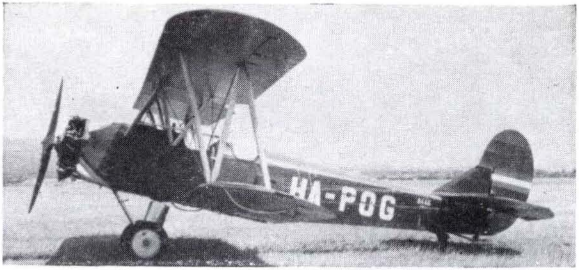
Built under sub-contract to Grumman by Schweizer Aircraft, the Ag-Cat flew for the first time on May 22, 1957, production deliveries commencing in July 1960. A container for agricultural chemicals is housed in the fuselage ahead of the cockpit, and a load of 1,200 lb. of chemicals may be carried.

Nationality: American. **Type:** Single-seat Agricultural Biplane. **Power Plant:** One 220 h.p. Continental W-670-11 radial. **Weights:** Empty, 2,150 lb.; loaded, 3,700 lb. **Performance:** Max. speed, 114 m.p.h.; max. cruising, 80 m.p.h.; initial climb, 492 ft./min.; service ceiling, 6,900 ft.; econ. cruising, 75 m.p.h. at 3,000 ft.; range (at econ. cruising without reserves), 216 mls. **Dimensions:** Span, 35 ft. 8 in.; length, 24 ft. 6 in.; height, 10 ft. 9 in.; wing area, 326 sq. ft.

POLIKARPOV PO-2 (MULE)

Designed by N. N. Polikarpov in 1924, and first flown in 1927, the Po-2 was built in vast numbers, remaining in production until 1944. Production of the Po-2 was undertaken in Poland during 1946-9 as the C.S.S.13. The Po-2 is currently flying in most communist countries, and is used as a primary trainer and club aircraft, for agricultural purposes and fire-fighting, and as an ambulance aircraft.

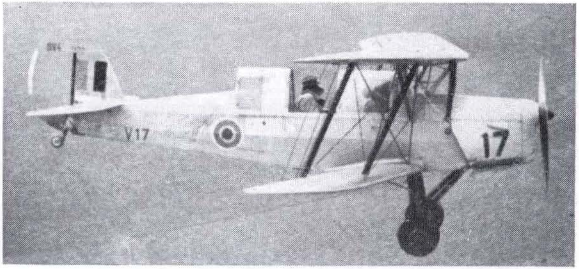
Nationality: Russian. **Type:** Two-seat General-purpose Biplane. **Power Plant:** One 110 h.p. M-11 radial. **Weights:** Empty, 1,342 lb.; loaded, 1,910 lb. **Performance:** Max. speed, 97 m.p.h.; cruising, 78 m.p.h.; time to 3,280 ft., 5 min., to 6,560 ft., 14 min.; ceiling, 13,125 ft. **Dimensions:** Span, 37 ft. 5 in.; length, 26 ft. 9½ in.; height, 9 ft. 11 in.; wing area, 415 sq. ft.



STAMPE S.V.4B

Currently serving with the Belgian Air Force for preliminary pilot grading, the S.V.4 is a pre-war design which was revived shortly after the war, a series powered by the 125 h.p. Gipsy Major II being produced by the Société Stampe et Rénard as the S.V.4B. Production was also undertaken in France by the S.N.C.A. du Nord, French-built machines being powered by the 140 h.p. Renault 4POI or 4P-O3 and designated S.V.4C.

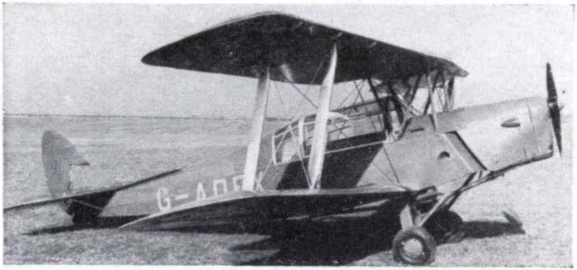
Nationality: Belgian. **Type:** Two-seat Primary Trainer. **Power Plant:** One 125 h.p. de Havilland Gipsy Major II engine. **Weights:** Empty, 1,056 lb.; loaded, 1,716 lb. **Performance:** Max. speed, 112 m.p.h.; cruising, 100 m.p.h.; time to 3,280 ft. 3 min. 40 sec. **Dimensions:** Span, 31 ft. 10 in.; length, 23 ft. 3 in.; height, 8 ft. 6 in.; wing area, 258·334 sq. ft.

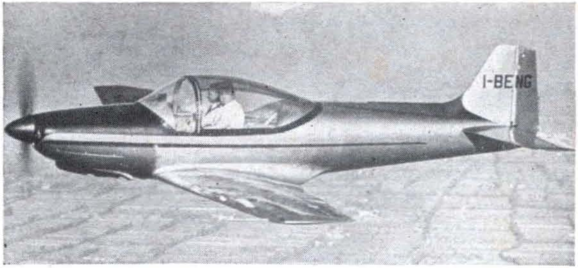


THRUXTON JACKAROO

The Thruxton Jackaroo is a four-seat cabin conversion of the D.H.82 Tiger Moth undertaken by Jackaroo Aircraft Ltd. Originally evolved as a dual-purpose aircraft with interchangeable top deckings permitting the aircraft to be adapted as a single-seat agricultural aircraft, the Jackaroo conversion is now delivered only in its basic four-seat form. The engine is mounted further forward than that of the original Tiger Moth to offset the greater weight aft of the c.g.

Nationality: British. **Type:** Four-seat Cabin Biplane. **Power Plant:** One 130 h.p. de Havilland Gipsy Major I. **Weights:** Empty, 1,360 lb.; loaded, 2,181 lb. **Performance:** Max. speed, 104 m.p.h.; econ. cruising, 85 m.p.h. **Dimensions:** Span, 30 ft. 4½ in.; length, 25 ft. 9 in.; height, 8 ft. 10 in.; wing area, 246·7 sq. ft.

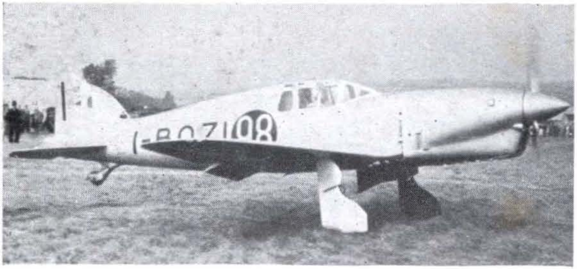




AEROMERE FALCO F.8.L AMERICA

The Falco, designed by Ing. Stelio Frati, was flown for the first time on June 15, 1955 with a 90 h.p. Continental C90 engine. Production was initially undertaken by Aviamilano but subsequently taken over by Aeromere. Aviamilano produced ten F.8.L Series I Falcos with the 135 h.p. Lycoming, and subsequently built the Series II with the 150 h.p. Lycoming. The Aeromere version is known as the F.8.L America and is basically similar to the Aviamilano-built Series II.

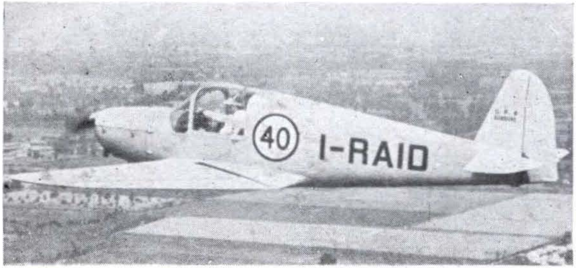
Nationality: Italian. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 150 h.p. Lycoming O-320 engine. **Weights:** Empty, 1,147 lb.; loaded, 1,720 lb. **Performance:** Max. speed, 202 m.p.h.; econ. cruising, 162 m.p.h. **Dimensions:** Span, 26 ft. 3 in.; length, 21 ft. 4 in.; height, 7 ft. 6 in.; wing area, 107·5 sq. ft.



AMBROSINI S.7

Of basically pre-war design, the S.7 was produced after the war in both single-seat and two-seat versions for the Italian Air Force and for private owners. An externally similar development of the basic design, the Super S.7, or Supersette, is powered by the 340 b.h.p. de Havilland Gipsy Queen 70-3 engine. The S.7 no longer serves with the Italian Air Force but a number are privately owned.

Nationality: Italian. **Type:** Two-seat Basic Trainer. **Power Plant:** One 225 h.p. Alfa 115ter engine. **Weights:** Empty, 2,365 lb.; loaded, 3,030 lb. **Performance:** Max. speed, 224 m.p.h.; cruising, 165 m.p.h. at 2,950 ft.; initial climb, 1,103 ft./min.; service ceiling, 17,220 ft. **Dimensions:** Span, 28 ft. 10 in.; length, 26 ft. 10 in.; height, 9 ft.; wing area, 137·8 sq. ft.



AMBROSINI F.4 AND F.7 RONDONE

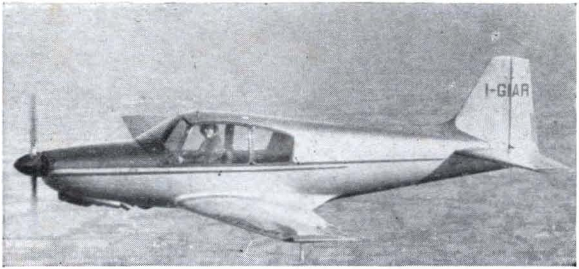
The Rondone was produced in two versions, the two-seat F.4 and the three-seat F.7, the latter originally being known as the Airone. The first batch of ten F.4 Rondones were built by the S.A.I. Ambrosini and subsequent aircraft were produced by Legnami Pasotti under licence. The two-seat F.4 differs from the F.7 described by the specification in having a 65 h.p. Walter Mikron II engine, and empty and loaded weights of 749 lb. and 1,212 lb.

Nationality: Italian. **Type:** Three-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C90 engine. **Weights:** Empty 1,124 lb.; loaded, 1,742 lb. **Performance:** Max. speed, 149 m.p.h.; cruising, 130 m.p.h.; range, 385 mls. **Dimensions:** Span, 30 ft. 6 in.; length, 22 ft. 3½ in.; height, 7 ft. 6 in.; wing area, 142 sq. ft.

AVIAMILANO F.14 NIBBIO

Derived from the two-seat F.8 Falco, the F.14 Nibbio (Kite) was flown for the first time on January 16, 1958, and the first production batch of ten aircraft had been completed by the end of 1959. The Nibbio is of all-wood construction, and retains the same aerofoil sections, wing loading and power-to-weight ratios of the smaller Falco.

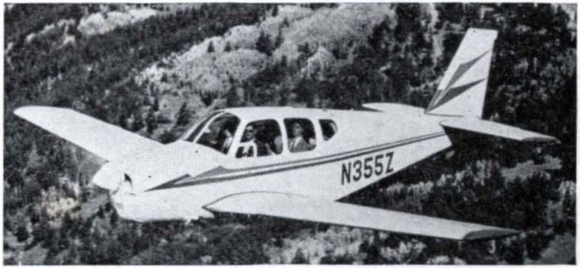
Nationality: Italian. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A1A engine. **Weights:** Empty, 1,496 lb.; loaded, 2,530 lb. **Performance:** Max. speed, 205 m.p.h.; max. cruising, 192 m.p.h.; econ. cruising, 168 m.p.h.; range, 932 mls. at 5,000 ft.; service ceiling, 17,700 ft. **Dimensions:** Span, 31 ft. 2½ in.; length, 23 ft. 7¼ in.; height, 8 ft. 1¼ in.; wing area, 128 sq. ft.



BEECH A33 DEBONAIR

The Debonair is basically similar in general configuration to the Bonanza described below, but conventional tail surfaces replace the "butterfly" type unit featured by the latter. The Debonair was flown for the first time on September 14, 1959, and 238 production machines were delivered during 1960.

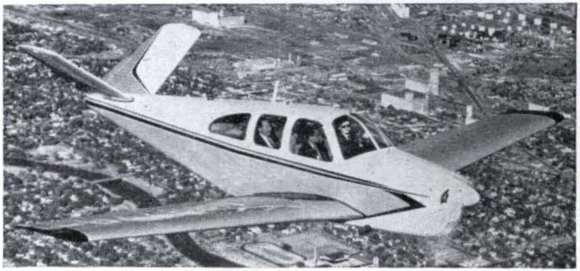
Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 225 h.p. Continental IO-470-J engine. **Weights:** Empty, 1,730 lb.; loaded, 2,900 lb. **Performance:** Max. speed, 195 m.p.h.; max. cruising (75% power), 185 m.p.h. at 7,000 ft.; econ. cruising (45% power), 143 m.p.h. at 10,000 ft.; initial climb, 1,010 ft./min.; service ceiling, 19,800 ft.; range, 1,710 mls. at 143 m.p.h. at 10,000 ft. **Dimensions:** Span, 32 ft. 10 in.; length, 25 ft. 6 in.; height, 8 ft. 3 in.; wing area, 177·6 sq. ft.

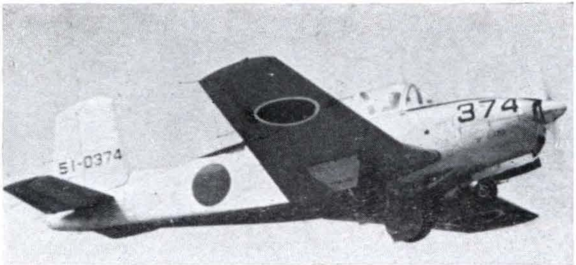


BEECH N35 BONANZA

Commercial deliveries of the Model 35 Bonanza began in February 1947, and some 7,000 examples have since been produced. The current production version, the N35, features the new square-tipped wings of slightly greater area first introduced in 1960 on the M35, but all production models are externally similar, each embodying minor refinements.

Nationality: American. **Type:** Four/five-seat Cabin Monoplane. **Power Plant:** One 260 h.p. Continental IO-470-N engine. **Weights:** Empty, 1,855 lb.; loaded, 3,125 lb. **Performance:** Max. speed, 205 m.p.h.; max. cruising (75% power), 200 m.p.h. at 7,000 ft.; econ. cruising (65% power), 195 m.p.h.; initial climb, 1,170 ft./min.; range, 1,215 mls. **Dimensions:** Span, 33 ft. 5½ in.; length, 25 ft. 1 in.; height, 6 ft. 6½ in.; wing area, 181 sq. ft.

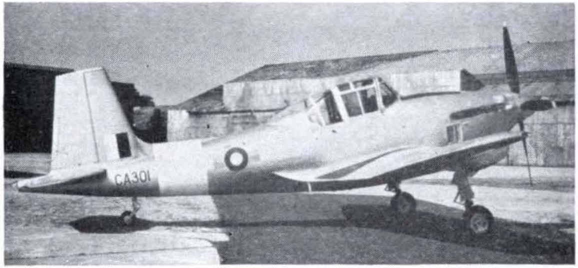




BEECH T-34A MENTOR

Basically a primary trainer adaptation of the Bonanza, the Mentor flew for the first time on December 2, 1948, and more than 350 were delivered to the U.S.A.F. as the T-34A and 423 to the U.S. Navy as the T-34B. Fuji Heavy Industries built 176 Mentors, thirty-six of these being delivered to the Philippines and the remainder to the J.A.S.D.F., 125 were manufactured in Canada and seventy-five have been assembled in Argentina.

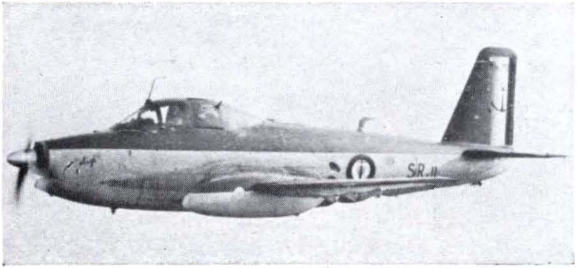
Nationality: American. **Type:** Two-seat Primary Trainer. **Power Plant:** One 225 h.p. Continental O-470-13 engine. **Weights:** Empty, 2,156 lb.; loaded, 2,950 lb. **Performance:** Max. speed, 188 m.p.h.; cruising, 167 m.p.h.; initial climb, 1,230 ft./min. **Dimensions:** Span, 32 ft. 9¾ in.; length, 25 ft. 11¼ in.; height, 9 ft. 7 in.; wing area, 177·6 sq. ft.



BOULTON PAUL BALLIOL T.2

Although no longer serving with R.A.F. Training Command in the advanced training rôle, the Balliol T.2 is employed by the R.Cy.A.F. which received nine of these trainers in 1953. A version with an arrester hook, small diameter airscrew and a strengthened undercarriage serves with the Fleet Air Arm as the Sea Balliol T.21. The photograph depicts a Ceylonese Balliol.

Nationality: British. **Type:** Advanced Trainer. **Power Plant:** One 1,245 h.p. Rolls-Royce Merlin 35 engine. **Weights:** Empty, 6,730 lb.; loaded, 8,410 lb. **Performance:** Max. speed, 288 m.p.h. at 9,000 ft.; initial climb, 1,790 ft./min.; time to 10,000 ft., 6 min.; service ceiling, 32,500 ft.; endurance, 3 hrs. at 220 m.p.h. **Dimensions:** Span, 39 ft. 4 in.; length, 35 ft. 1½ in.; height, 12 ft. 6 in.; wing area, 250 sq. ft.



BREGUET 1050 ALIZÉ

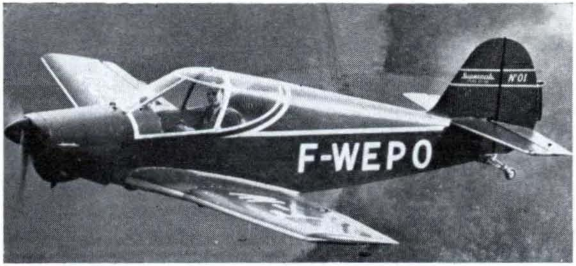
The Alizé (Tradewind) was first flown on October 6, 1956, and seventy-five have been delivered to the Aéronavale and fifteen to the Indian Navy. The Alizé can carry three 353-lb. depth charges or one torpedo internally, and two 353-lb. or 386-lb. depth charges and six 5-in. rockets or two air-to-surface missiles underwing.

Nationality: French. **Type:** Three-seat Shipboard Anti-submarine Aircraft. **Power Plant:** One 2,100 e.s.h.p. Rolls-Royce Dart R.Da.21 turboprop. **Weights:** Empty, 12,566 lb.; normal loaded, 18,100 lb. **Performance:** Max. speed, 285 m.p.h. at sea level, 292 m.p.h. at 10,000 ft.; initial climb, 1,380 ft./min.; service ceiling, 20,000 ft. **Dimensions:** Span, 51 ft. 2 in.; length, 45 ft. 6 in.; height, 15 ft. 7 in.; wing area, 387·5 sq. ft.

C.A.B. GY-30 SUPERCAB

The GY-30 Supercab is a development of the GY-20 Minicab from which it differs primarily in having a more powerful engine and a retractable undercarriage. The Supercab was flown for the first time on February 5, 1954, and a small series of aircraft was produced by the Constructions Aéronautiques du Béarn (C.A.B.). The Supercab is of wooden construction.

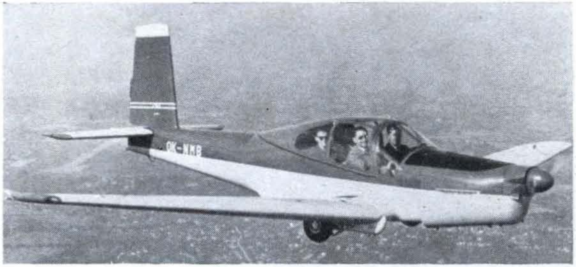
Nationality: French. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C90 engine. **Weights:** Empty, 880 lb.; loaded, 1,348 lb. **Performance:** Max. speed, 170 m.p.h.; econ. cruising, 146 m.p.h.; initial climb rate, 767 ft./min.; service ceiling, 16,400 ft.; range (at econ. cruising), 746 mls. **Dimensions:** Span, 26 ft. 10 in.; length, 18 ft.; height, 5 ft. 5 in.; wing area, 110·8 sq. ft.



C.Z.L. L-40 META-SOKOL

Unusual in featuring a "reverse tricycle" undercarriage, the Meta-Sokol was flown for the first time in 1954 with a 105 h.p. Minor 4-III engine. Re-engined with the supercharged M-332, it completed its test programme in March 1956, and has since been manufactured in some numbers. The initial production machines were completed as three-seaters.

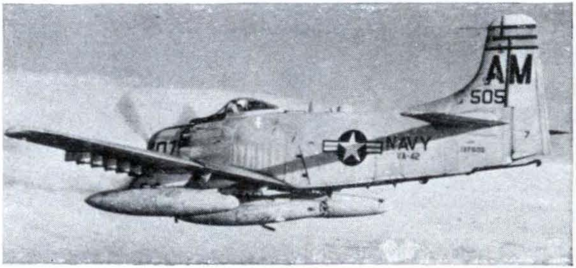
Nationality: Czechoslovakian. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 140 h.p. Walter M-332 engine. **Weights:** Empty, 1,177 lb.; loaded, 2,062 lb. **Performance:** Max. speed, 149 m.p.h.; cruising, 134 m.p.h.; initial climb, 885 ft./min.; service ceiling, 16,400 ft.; range, 688 mls.; maximum endurance, 7 hrs. 5 min. **Dimensions:** Span, 33 ft. 9 in.; length, 24 ft. 9 in.; height, 8 ft. 3 in.; wing area, 156 sq. ft.

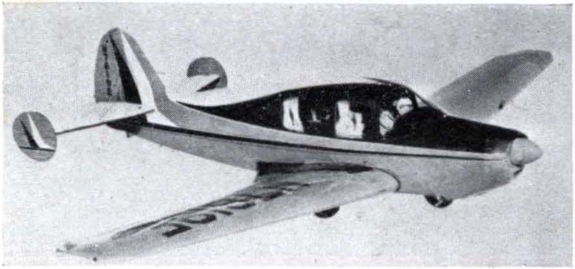


DOUGLAS AD-6 SKYRAIDER

The AD-6 single-seat attack bomber is one of the many variants of the versatile Skyraider still in operational service, although it is now being phased out in favour of the A4D-2 Skyhawk. Other current variants include the so-called "multiplex" AD-5 which can undertake any one of twelve rôles, and the single-seat AD-7. The Skyraider serves with Vietnam and the Armée de l'Air.

Nationality: American. **Type:** Single-seat Shipboard Attack Bomber. **Power Plant:** One 2,700 h.p. Wright R-3350-26WB engine. **Armament:** Two 20-mm. cannon and up to 10,000 lb. bombs. **Weights:** Empty, 10,550 lb.; max. loaded, 25,000 lb. **Performance:** Max. speed, 365 m.p.h.; max. range, 3,000 mls. **Dimensions:** Span, 50 ft. 0¼ in.; length, 38 ft. 10½ in.; height, 15 ft. 8 in.; wing area, 400·33 sq. ft.

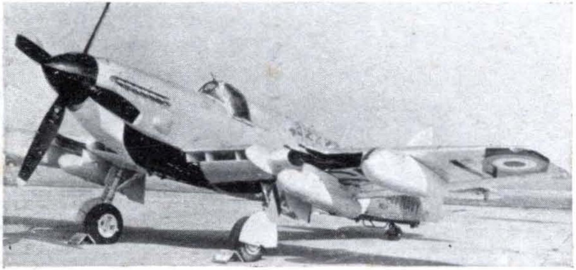




DOWNER BELLANCA 260 MODEL 14-19-3

The Bellanca 260 produced by Downer Aircraft Industries (formerly Northern Aircraft) is derived from the Model 14-19-2 Cruisemaster, 104 examples of which were built after the purchase by the company of the Bellanca Aircraft Corp. The Cruisemaster was powered by a 230 h.p. Continental O-470-K engine and featured a tailwheel undercarriage. The Model 14-19-3 which first flew on November 15, 1958, has a nosewheel undercarriage.

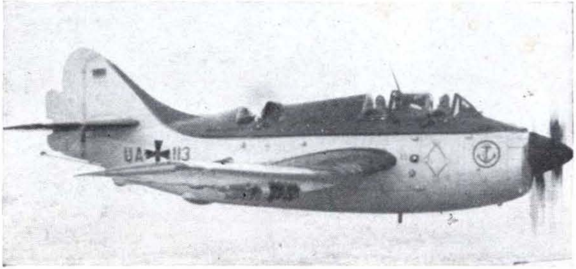
Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 260 h.p. Continental IO-470-F engine. **Weights:** Empty, 1,690 lb.; loaded, 2,700 lb. **Performance:** Max. speed, 207 m.p.h.; cruising, 203 m.p.h. at 9,000 ft.; initial climb, 1,750 ft./min.; range, 880 mls. **Dimensions:** Span, 34 ft. 2 in.; length, 22 ft. 11 in.; height, 6 ft. 4 in.; wing area, 161·5 sq. ft.



FAIREY FIREFLY T.T.4

The Firefly T.T.4 which currently serves with the Indian Navy is one of several versions of the basic design still flying, including Firefly U.9 target drones with the Fleet Air Arm; Firefly T.5s and A.S.6s with the Royal Australian Navy; Firefly T.4s and T.5s with the R.N.N.A.S., and Firefly F.1s with the Imperial Ethiopian Air Force.

Nationality: British. **Type:** Two-seat Target Tug. **Power Plant:** One 2,245 h.p. Rolls-Royce Griffon 74 engine. **Weights:** Empty, 9,700 lb.; loaded, 14,200 lb. **Performance:** Max. speed, 386 m.p.h. at 14,000 ft.; max. range, 1,300 mls.; climb to 10,000 ft., 7 min. 9 sec.; service ceiling, 28,800 ft.; max. endurance, 6 hr. 30 min. **Dimensions:** Span, 41 ft. 2 in.; length, 37 ft. 11 in.; height, 14 ft. 4 in.; wing area, 330 sq. ft.



FAIREY GANNET A.S.4

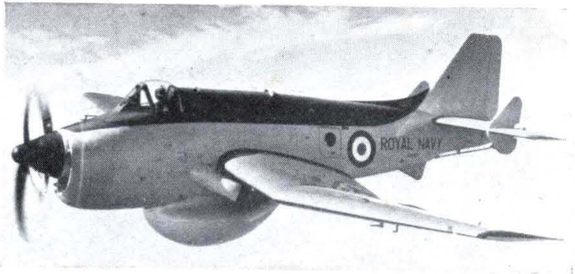
Although no longer in first-line operational service with the Fleet Air Arm, the Gannet A.S.4 is in service with the Deutsche Kriegsmarine and the Indonesian Navy, these services having received fifteen and fourteen aircraft of this type respectively. The Gannet A.S.4 can carry two torpedoes or two 1,000-lb. parachute mines internally and sixteen 60-lb. rockets, six depth charges or two mines externally.

Nationality: British. **Type:** Three-seat Anti-submarine Aircraft. **Power Plant:** One 3,035 e.h.p. Bristol Siddeley Double Mamba 101 turboprop. **Weights:** Empty, 14,069 lb.; max. loaded, 23,446 lb. **Performance:** Max. speed, 299 m.p.h. at sea level; normal range, 662 mls. at 194 m.p.h. at sea level. **Dimensions:** Span, 54 ft. 4 in.; length, 43 ft.; height, 13 ft. 8½ in.; wing area, 490 sq. ft.

FAIREY GANNET A.E.W.3

Built in small quantities for the Fleet Air Arm, the Gannet A.E.W.3 entered service with No. 849 Squadron in 1960, the prototype having flown for the first time on August 20, 1958. The Gannet A.E.W.3 differs considerably from the A.S.4 described on the opposite page. Two radar observers are housed in a cabin amidships, and a large radar scanner is mounted ventrally.

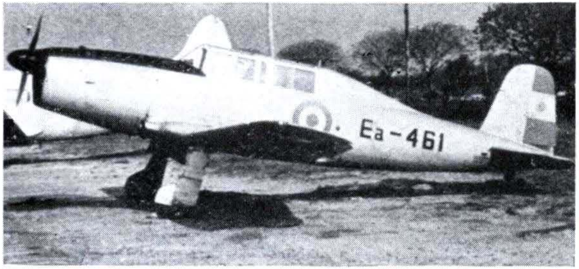
Nationality: British. **Type:** Three-seat Shipboard Early Warning Aircraft. **Power Plant:** One 3,875 e.h.p. Bristol Siddeley Double Mamba 102 coupled turboprop. **Weight:** Loaded, 20,000–25,000 lb. **Performance:** Approx. max. speed, 250 m.p.h. at 5,000 ft.; approx. service ceiling, 25,000 ft.; normal endurance, 4–5 hr. **Dimensions:** Span, 54 ft. 4 in.; length, 44 ft.; height, 16 ft. 10 in.; wing area, 482·8 sq. ft.



FIAT G.46-5

Employed by the Italian Air Force as a standard basic trainer for a number of years, the G.46 currently serves with the Argentine Air Force (illustrated) and the Austrian Air Force. Others are used by private owners and civil flying schools. Several versions were produced, including the G.46-1 with a 205 h.p. Alfa 115bis, the G.46-2 with a 250 h.p. D.H. Gipsy, and the G.46-3, -4, and -5 with the 225 h.p. Alfa 115ter.

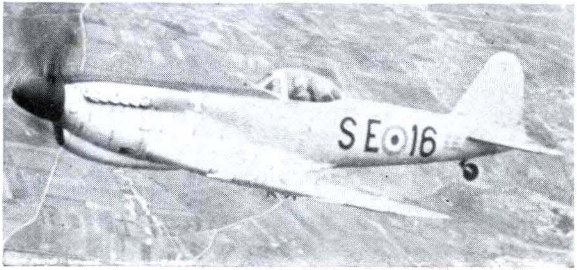
Nationality: Italian. **Type:** Two-seat Basic Trainer. **Power Plant:** One 225 h.p. Alfa 115-1ter engine. **Weights:** Empty, 2,442 lb.; loaded, 3,102 lb. **Performance:** Max. speed, 196 m.p.h.; cruising, 178 m.p.h.; initial climb, 1,280 ft./min.; service ceiling, 19,850 ft.; range, 570 mls. **Dimensions:** Span, 34 ft. 1¼ in.; length, 27 ft. 10 in.; height, 7 ft. 10 in.; wing area, 173 sq. ft.

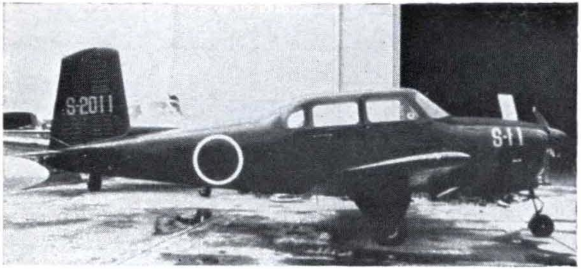


FIAT G.59-4B

Derived from the wartime G.55 Centauro fighter, the G.59 entered production in 1948, the initial models being the G.59-1 and -2 with the 1,610 h.p. Merlin 24. The G.59-3 had the Merlin 500/20 engine, and the final production model, the G.59-4, had a cut-down rear fuselage and all-round vision hood. The single- and two-seat versions are designated G.59-4A and -4B.

Nationality: Italian. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 1,400 h.p. Rolls-Royce Merlin 500/20 engine. **Weights:** Empty, 6,285 lb.; loaded, 7,275 lb. **Performance:** Max. speed, 372 m.p.h.; cruising, 292 m.p.h.; range, 524 mls.; time to 16,400 ft., 5 min. 20 sec., to 26,250 ft., 9 min. 40 sec.; service ceiling, 37,000 ft. **Dimensions:** Span, 38 ft. 10½ in.; length, 31 ft. 1 in.; height, 12 ft. 1 in.; wing area, 228 sq. ft.

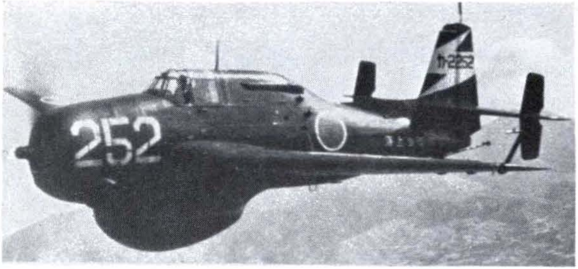




FUJI LM-1 NIKKO

The Nikko is an adaptation of the Beech B-45 Mentor airframe with an enlarged cockpit capable of accommodating four or five persons. Twenty-seven Nikko liaison aircraft were produced for the J.G.S.D.F., and one of two additional machines built has been fitted with a 340 h.p. Lycoming GSO-480-B1A6, flying for the first time on December 1, 1958, as the KM-1. A trainer development, the KM-2, is to be produced for the J.M.S.D.F.

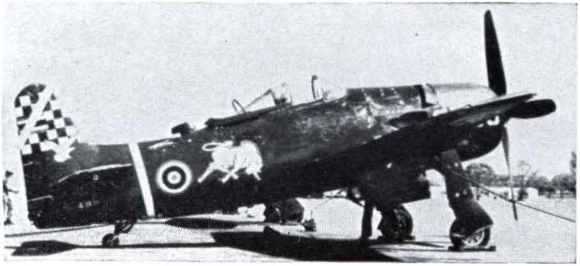
Nationality: Japanese. **Type:** Four/five-seat Liaison Monoplane. **Power Plant:** One 225 h.p. Continental O-470-13 engine. **Weights:** Empty, 2,080 lb.; max. loaded, 3,527 lb. **Performance:** Max. speed, 185 m.p.h.; cruising, 148 m.p.h. **Dimensions:** Span, 32 ft. 10 in.; length, 25 ft. 11 in.; height, 9 ft. 7 in.; wing area, 177·6 sq. ft.



GRUMMAN TBM-3 AVENGER

A small number of Avengers remain in service with various air arms in second-line rôles, that illustrated being one of the few TBM-3W-2 models still serving with the J.M.S.D.F. A few TBM-1Cs serve with the Uruguayan Navy, one or two TBF-1s are used as target-tugs by the R.N.Z.A.F., and a few civil conversions are used for agricultural duties. A total of 9,834 Avengers was completed during World War II.

Nationality: American. **Type:** Three-seat Anti-submarine Aircraft. **Power Plant:** One 1,750 h.p. Wright R-2600-20 radial. **Weights:** Empty, 10,700 lb.; loaded, 15,520 lb. **Performance:** Max. speed, 269 m.p.h.; cruising, 148 m.p.h.; ceiling, 22,600 ft.; range, 900 mls. **Dimensions:** Span, 54 ft. 2 in.; length, 40 ft. 11½ in.; height, 16 ft. 5 in.; wing area, 491·76 sq. ft.



GRUMMAN F8F-1D BEARCAT

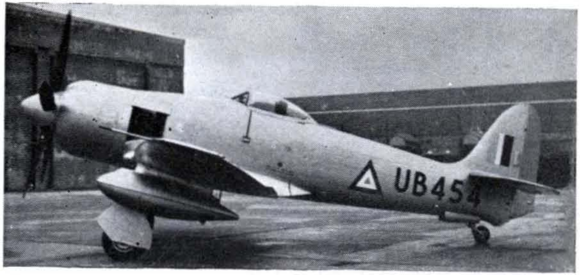
The F8F-1D Bearcat currently serves with the Thai and Vietnamese air arms as a fighter-bomber. Originally developed as a shipboard fighter for the U.S. Navy, the F8F-1 first flew late in 1944 and was too late to see combat during W.W. II. For several years after the war it remained a standard U.S. Navy type.

Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 2,500 h.p. Pratt and Whitney R-2800-22W radial. **Armament:** Four 0·5-in. guns and four 5-in. rockets or 2,000-lb. bomb load. **Weights:** Empty, 6,733 lb.; normal loaded, 8,788 lb. **Performance:** Max. speed, 424 m.p.h. at 17,300 ft., 393 m.p.h. at sea level; econ. cruising, 175 m.p.h.; range (internal fuel), 955 mls.; initial climb, 4,800 ft./min. **Dimensions:** Span, 35 ft. 6 in.; length, 28 ft.; height, 13 ft. 8 in.; wing area, 244 sq. ft.

HAWKER SEA FURY F.B.11

The Sea Fury operated with first-line units of the Fleet Air Arm until 1954, and the type was manufactured in the Netherlands as the Sea Fury F.B.51. Twenty reconditioned Sea Fury F.B.11s were supplied to Burma during 1957–8, one of these being illustrated, and a land-based version was supplied to Iraq and Pakistan, those for the latter air arm being designated Fury F.B.60s. Some of these have now been modified as Fury T.T.60 target-tugs.

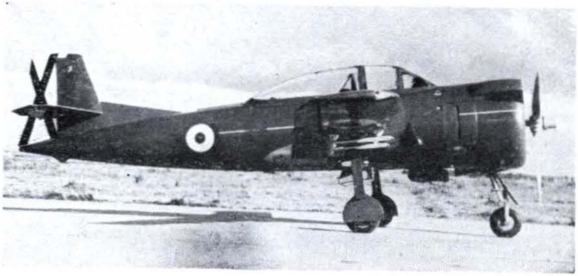
Nationality: British. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 2,550 h.p. Bristol Centaurus 18 radial. **Armament:** Four 20-mm. cannon and 2,000-lb. bomb load. **Weights:** Loaded, 12,350 lb. **Performance:** Max. speed, 460 m.p.h. **Dimensions:** Span, 38 ft. 4¾ in.; length, 34 ft. 8 in.; height, 15 ft. 10½ in.; wing area, 280 sq. ft.



HISPANO HA-100E-1 TRIANA

The HA-100E-1 Triana is currently in production fo rthe Spanish Air Force, the initial production order calling for the delivery of forty machines. The Triana flew for the first time on December 10, 1954, and two prototypes have been fitted with the 800 h.p. Wright 957 C-7B-A1 radial under the designation HA-100F-1 for comparative trials. The Triana can be used for armament training for which two 12·7-mm. guns are carried.

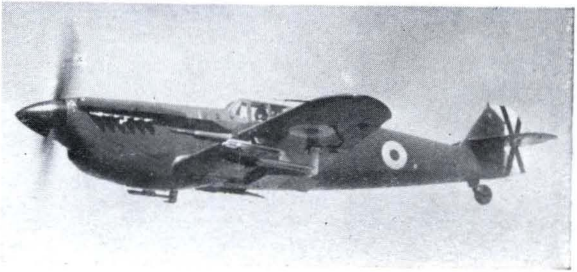
Nationality: Spanish. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 750 h.p. E.N.M.A. Beta B-4 radial. **Weights:** Empty, 4,343 lb.; loaded, 6,459 lb. **Performance:** Max. speed, 276 m.p.h.; cruising, 237 m.p.h.; initial climb, 2,132 ft./min. **Dimensions:** Span, 34 ft. 1 in.; length, 29 ft. 5 in.; height, 9 ft. 9½ in.; wing area, 186·6 sq. ft.

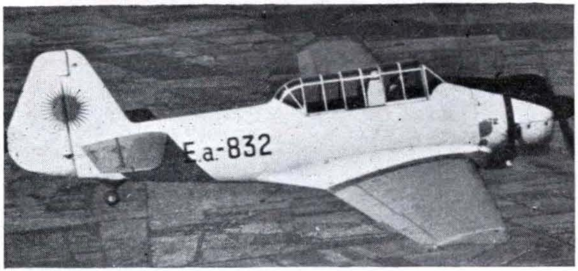


HISPANO HA-1112-M1L BUCHON

The Buchon was the final Spanish production development of the wartime German Messerschmitt Bf 109G fighter, and currently equips two fighter-bomber wings of the Spanish Air Force. The first Merlin-engined version of the basic design was designated HA-1109-M1L, this being preceded by several versions powered by the Hispano-Suiza 12-Z-17 engine.

Nationality: Spanish. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 1,400 h.p. Rolls-Royce Merlin 500-45 engine. **Armament:** Two 20-mm. cannon and eight 80-mm. rockets. **Weights:** Empty, 5,855 lb.; max. loaded, 7,011 lb. **Performance:** Max. speed, 419 m.p.h. at 13,120 ft.; initial climb, 5,581 ft./min.; range, 476 mls. **Dimensions:** Span, 32 ft. 6½ in.; length, 29 ft. 10½ in.; height, 8 ft. 6⅓ in.; wing area, 172·223 sq. ft.

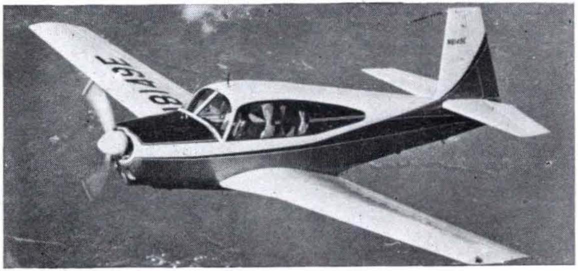




I.AÉ.D.L.22

Currently being phased out of service in favour of the North American T-28A in the Argentine Air Force, the I.Aé.D.L.22 was first flown on May 25, 1943, production deliveries commencing in 1944. In 1945, a second version intended for close-support duties, the D.L.22-C powered by the 475 h.p. Armstrong Siddeley Cheetah 25, was delivered, but this type has now been withdrawn from service.

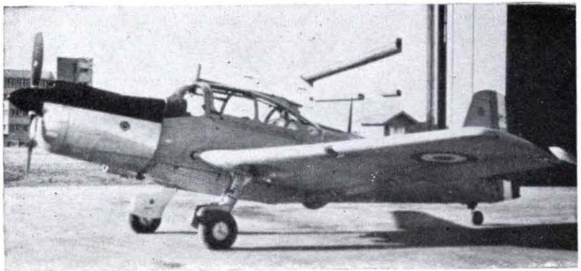
Nationality: Argentinian. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 450 h.p. I.A.16 El Gaucho radial. **Weights:** Empty, 3,351 lb.; loaded, 4,994 lb. **Performance:** Max. speed, 180 m.p.h. at 1,475 ft.; cruising, 162 m.p.h.; ceiling, 17,060 ft.; range, 746 mls. **Dimensions:** Span, 41 ft. 4¾ in.; length, 30 ft. 2½ in.; height, 9 ft. 3 in.; wing area, 249·5 sq. ft.



MOONEY MARK 20A

The Mark 20 was flown for the first time on August 10, 1953, and the Mark 20A is essentially similar apart from the installation of a more powerful engine in place of the 150 h.p. Lycoming O-320 of the original model. The airframe of the Mark 20A is manufactured from pressure-bonded laminated spruce, and the Mark 21, which appeared in 1960 and is the current production model, is externally similar but of all-metal construction. Production deliveries began in 1961.

Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A engine. **Weights:** Empty, 1,480 lb.; max. loaded, 2,450 lb. **Performance:** Max. speed, 190 m.p.h.; econ. cruising, 164 m.p.h. **Dimensions:** Span, 35 ft.; length, 23 ft. 2 in.; height, 8 ft. 4½ in.; wing area, 167 sq. ft.



MORANE-SAULNIER M.S.733 ALCYON

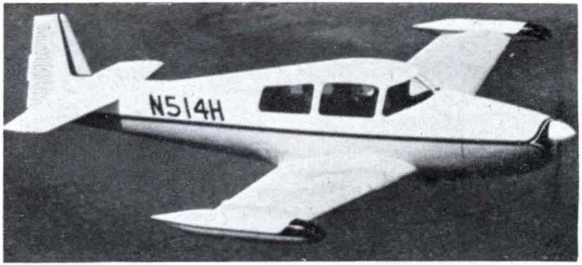
Now employed by the Armée de l'Air primarily for grading flying, the M.S.733 Alcyon is derived from the M.S.730 which was first flown on August 11, 1949. The Alcyon flew on September 25, 1951, and one hundred and thirty were produced. Fifteen aircraft of this type were delivered to the Cambodian government, some of these being fitted with armament for policing.

Nationality: French. **Type:** Two/three-seat Basic Trainer. **Power Plant:** One 240 h.p. Potez 6D.30 engine. **Weights:** Empty, 2,780 lb.; loaded, 3,680 lb. **Performance:** Max. speed, 162 m.p.h. at sea level; cruising, 143 m.p.h.; initial climb, 825 ft./min.; service ceiling, 15,750 ft.; endurance, 4 hrs. at 3,280 ft. **Dimensions:** Span, 37 ft.; length, 30 ft. 7 in.; height, 7 ft. 11½ in.; wing area, 235·6 sq. ft.

NAVION RANGEMASTER

The Rangemaster, produced by the Navion Aircraft Company, is a refined five-seat development of the original Navion produced by North American Aviation and, subsequently, by the Ryan Aeronautical Company. Liaison versions of the original model for the U.S.A.F. were designated L-17A and B, and the L-17C was the L-17A modified by Ryan. The Rangemaster is generally similar externally to the original Navion.

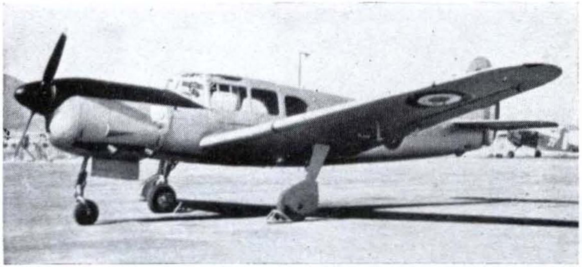
Nationality: American. **Type:** Five-seat Cabin Monoplane. **Power Plant:** One 260 h.p. Continental IO-470-H engine. **Weights:** Empty, 1,950 lb.; loaded, 3,150 lb. **Performance:** Max. continuous speed, 194 m.p.h.; econ. cruising, 181 m.p.h.; initial climb, 1,250 ft./min. **Dimensions:** Span, 34 ft. 6 in.; length, 27 ft. 6 in.; height, 8 ft. 6 in.; wing area, 184·33 sq. ft.



NORD 1101 NORALPHA (RAMIER)

Evolved from the Messerschmitt Me 208, prototypes of which were built in France during the German occupation, the Nord 1101 was originally produced for commercial use as the Noralpha and for the Armée de l'Air and Aéronavale as the Ramier. Two hundred were produced for the French armed forces and are used for liaison and communications.

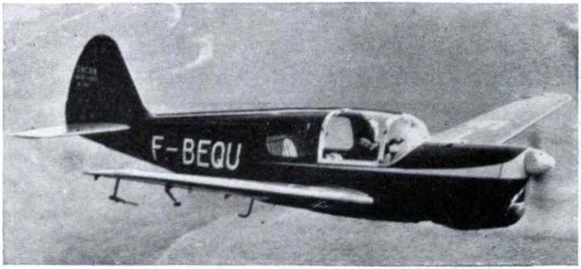
Nationality: French. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 240 h.p. Renault 6Q-10 engine. **Weights:** Empty, 2,090 lb.; loaded, 3,630 lb. **Performance:** Max. speed, 189 m.p.h.; cruising, 172 m.p.h.; service ceiling, 19,350 ft.; range (at economical cruising), 745 mls.; landing speed, 62 m.p.h. **Dimensions:** Span, 37 ft. 8 in.; length, 28 ft.; height, 10 ft. 8 in.; wing area, 187 sq. ft.

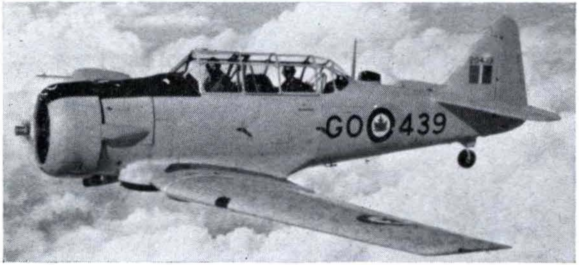


NORD 1203/II NORÉCRIN

A four-seater derived from the three-seat Nord 1201, the Nord 1203/II Norécrin appeared in 1948, an experimental version, the Nord 1204/02 being fitted with a 145 h.p. Continental C145-2 engine. Production of the Norécrin was suspended after 380 machines had been produced but resumed in 1955 when an official order for a further ninety machines was placed.

Nationality: French. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 135 h.p. Régnier 4LO engine. **Weights:** Empty, 1,437 lb.; loaded, 2,313 lb. **Performance:** Max. speed, 174 m.p.h.; cruising, 137 m.p.h.; initial climb, 985 ft./min.; range (at econ. cruising), 560 mls.; service ceiling, 16,400 ft. **Dimensions:** Span, 33 ft. 6¼ in.; length, 23 ft. 8 in.; height, 9 ft. 6 in.; wing area, 410 sq. ft.

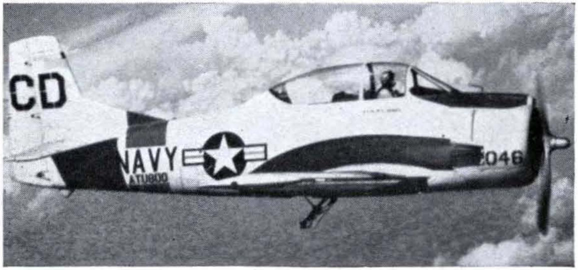




NORTH AMERICAN T-6G TEXAN

Although first produced in 1938, the Texan is currently the world's most widely used trainer. More than 10,000 were manufactured in the U.S.A. and Canada during the war, those for the U.S. Navy being designated SNJ-1, 2, 3, 4 and 5, and R.A.F. and R.C.A.F. versions being known as the Harvard. Production continued in Canada until 1954 as the T-6J for the U.S.A.F. and Harvard 4 for the R.C.A.F., and 2,068 wartime aircraft were remanufactured in 1949–50 as the T-6G.

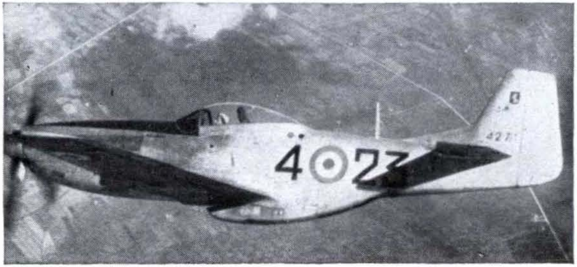
Nationality: American. **Type:** Basic Trainer. **Power Plant:** One 550 h.p. Pratt and Whitney R-1340-AN-1. **Weight:** Loaded, 5,617 lb. **Performance:** Max. speed, 212 m.p.h.; cruising, 146 m.p.h.; range, 870 mls. **Dimensions:** Span, 42 ft. 0¼ in.; length, 29 ft.; height, 11 ft. 8½ in.; wing area, 253·7 sq. ft.



NORTH AMERICAN T-28C TROJAN

The Trojan is the U.S. Navy version of the T-28B of the U.S.A.F. from which it differs only in having an arrester hook. A total of 1,948 T-28 trainers of all types was produced by North American of which 1,194 were the lower-powered T-28A (see Sud-Aviation Fennec, page 317) variant. The T-28C is used by a number of U.S. Navy VT (Training) and BTG (Basic Training) units. The T-28A serves with the air forces of Argentina, Cuba and Mexico.

Nationality: American. **Type:** Shipboard Basic Trainer. **Power Plant:** One 1,425 h.p. Wright R-1820-9HD radial. **Weight:** Max. loaded, 8,247 lb. **Performance:** Max. speed, 346 m.p.h.; cruising, 250 m.p.h.; initial climb, 3,830 ft./min.; service ceiling, 37,000 ft.; range, 1,035 mls. **Dimensions:** Span, 40 ft. 7½ in.; length, 32 ft. 9 in.; height, 12 ft. 7 in.; wing area, 268 sq. ft.



NORTH AMERICAN F-51D MUSTANG

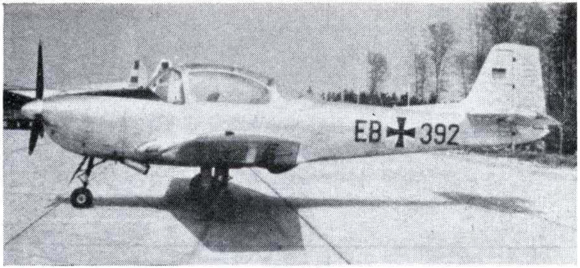
The F-51D Mustang, 7,966 examples of which were manufactured, serves with a number of Latin-American air forces, including those of Bolivia, Cuba, Dominican Republic, Guatemala, Honduras, Nicaragua. The first Mustang flew in October 1940, and production terminated with the 15,576th in 1946.

Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 1,695 h.p. Rolls-Royce/Packard Merlin V-1650-7 engine. **Armament:** Six 0·5-in. Browning guns and 2,000-lb. bomb load. **Weights:** Empty, 7,635 lb.; max. loaded, 11,600 lb. **Performance:** Max. speed, 437 m.p.h. at 25,000 ft., 413 m.p.h. at 15,000 ft.; initial climb, 3,475 ft./min.; service ceiling, 40,000 ft. **Dimensions:** Span, 37 ft.; length, 32 ft. 3 in.; height, 13 ft 8 in.; wing area, 233 sq. ft.

PIAGGIO P.149D

The P.149D, developed from the P.148 trainer (see page 330), was selected as a standard liaison and training aircraft by the Luftwaffe for which air arm seventy-two examples were purchased from Italy and a further 190 were manufactured under licence in Germany. Using many of the P.148's structural components, the P.149 flew for the first time on June 19, 1953.

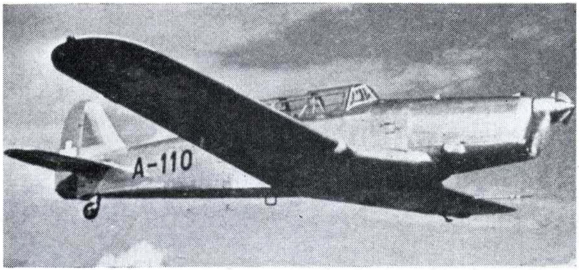
Nationality: Italian. **Type:** Four/five-seat Liaison and Training Aircraft. **Power Plant:** One 280 h.p. Lycoming GO-480 engine. **Weights:** Empty, 2,557 lb.; loaded, 3,704 lb. **Performance:** Max. speed, 192 m.p.h. at sea level, 177 m.p.h. at 6,560 ft.; cruising, 165 m.p.h. at 7,500 ft.; initial climb, 980 ft./min.; range (with reserves), 680 mls. **Dimensions:** Span, 36 ft. 5½ in.; length, 28 ft. 9½ in.; height, 9 ft. 6 in.; wing area, 202·46 sq. ft.



PILATUS P.2

Designed for operation from high-altitude alpine airfields and of exceptionally rugged construction, the P.2 was flown for the first time in 1945, the first batch of twenty machines being delivered to the Swiss Air Force during 1948–9. These were followed by a further batch equipped as armament trainers, carrying a light machine gun and equipped with racks for bombs or rocket projectiles.

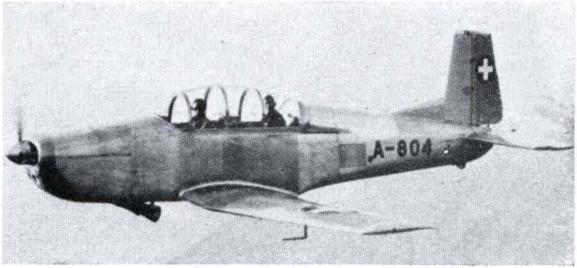
Nationality: Swiss. **Type:** Two-seat Advanced Trainer. **Power Plant:** One 465 h.p. Argus As 410A-2 engine. **Weights:** Empty, 3,040 lb.; loaded, 3,970 lb. **Performance:** Max. speed, 211 m.p.h. at 8,200 ft.; econ. cruising, 190 m.p.h. at 14,700 ft.; initial climb, 1,280 ft./min. **Dimensions:** Span, 36 ft.; length, 29 ft. 9 in.; height, 8 ft. 10 in.; wing area, 183 sq. ft.

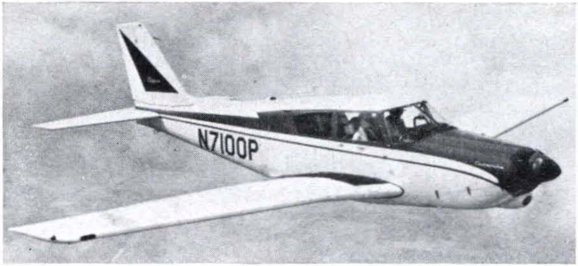


PILATUS P.3

The P.3 was flown for the first time on September 3, 1953, and the first of an initial series of eighteen aircraft flew in August 1954 with full military equipment. The P.3 was selected by the Swiss Air Force in competition with a number of other types, and the first of an order for fifty machines flew on May 8, 1956. For the armament training rôle, the P.3 carries a single 7·9-mm. gun and a pair of Oerlikon rocket launchers.

Nationality: Swiss. **Type:** Two-seat Basic Trainer. **Power Plant:** One 260 h.p. Lycoming GO-435-C2A engine. **Weights:** Empty, 2,447 lb.; loaded, 3,300 lb. **Performance:** Max. speed, 192 m.p.h. at sea level; econ. cruising, 156 m.p.h.; initial climb, 1,400 ft./min.; range, 466 mls. **Dimensions:** Span, 34 ft. 1 in.; length, 28 ft. 8½ in.; height 10 ft.; wing area, 177 sq. ft.

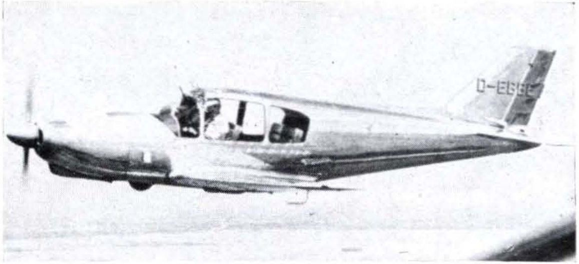




PIPER PA-24 COMANCHE

Flown for the first time on May 23, 1956, the Comanche has been in production since 1957, the first production machine having flown on October 21st of that year. Two versions have been produced: the PA-24-180 with a 180 h.p. Lycoming O-360-A1A engine, and the PA-24-250 described by the specification. The Comanche introduced several aerodynamic innovations for aircraft in its class, including laminar flow wings.

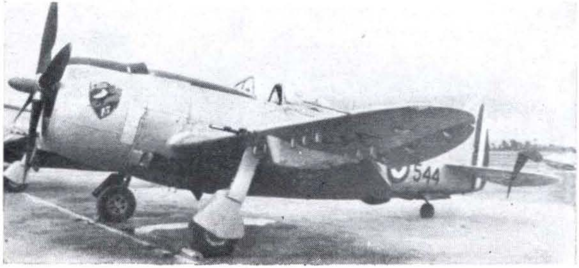
Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 250 h.p. Lycoming O-540-A1A engine. **Weights:** Empty, 1,600 lb.; loaded, 2,800 lb. **Performance:** Max. speed, 190 m.p.h.; cruising, 181 m.p.h.; range, 780 mls.; initial climb, 1,400 ft./min. **Dimensions:** Span, 36 ft.; length, 24 ft. 10¾ in.; height, 7 ft. 3 in.; wing area, 178 sq. ft.



PROCAER F.15 PICCHIO

Like the F.14 Nibbio (page 305), the F.15 Picchio (Woodpecker) has been designed by Stelio Frati, flying for the first time on May 7, 1959. The first series of fifteen aircraft were powered by the 160 h.p. Lycoming O-320-B1A engine, but the current production model, the F.15A (described by the specification) which flew on March 16, 1960, has an extra seat and a more powerful engine. Aluminium-covered plywood is used for skinning.

Nationality: Italian. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A1A engine. **Weights:** Empty, 1,345 lb.; loaded, 2,470 lb. **Performance:** Max. speed, 196 m.p.h.; max. cruising, 184 m.p.h.; econ. cruising, 168 m.p.h.; initial climb, 1,000 ft./min. **Dimensions:** Span, 30 ft. 7¼ in.; length, 24 ft. 7 in.; height, 9 ft. 2¾ in.; wing area, 131·5 sq. ft.



REPUBLIC F-47D THUNDERBOLT

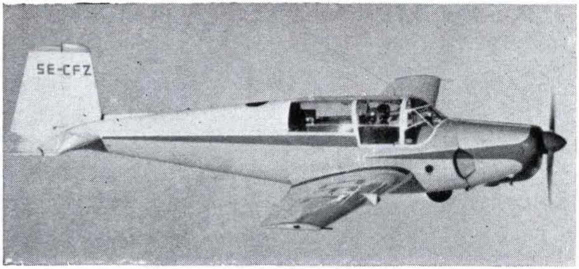
The F-47D Thunderbolt, 15,329 examples of which were built, is now largely confined to Latin-American air arms, currently serving with the air forces of Bolivia, Brazil, Colombia, Cuba, Dominican Republic, Ecuador, Honduras, Mexico and Peru. The accompanying photograph illustrates an F-47D of the Peruvian Air Force. Production of the Thunderbolt terminated in 1945.

Nationality: American. **Type:** Single-seat Fighter-bomber. **Power Plant:** One 2,300 h.p. Pratt and Whitney R-2800-59 radial. **Armament:** Six 0·5-in. guns and a 2,500-lb. bomb load. **Weights:** Empty, 10,700 lb.; max. loaded, 17,500 lb. **Performance:** Max. speed, 429 m.p.h. at 30,000 ft.; initial climb, 2,780 ft./min.; range, 950 mls. **Dimensions:** Span, 40 ft. 9 in.; length, 36 ft. 1 in.; height, 14 ft. 2 in.; wing area, 300 sq. ft.

SAAB-91D SAFIR

The Safir has been produced in four basic models. The initial model, the SAAB-91A, had the 145 h.p. Gipsy Major X. The SAAB-91B which appeared in 1951 differed in having a 190 h.p. Lycoming O-435-A and, like the -91A, was a three-seater. The SAAB-91C was a four-seater basically similar to the -91B, and the SAAB-91D described by the specification has a smaller engine.

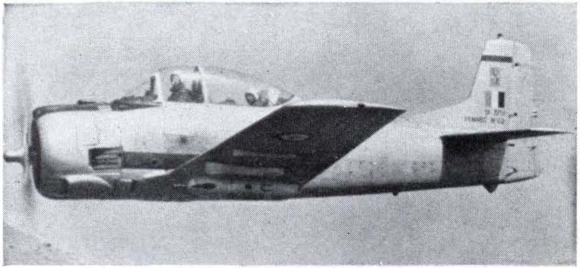
Nationality: Swedish. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A1A engine. **Weights:** Empty, 1,870 lb.; loaded, 2,660 lb. **Performance:** Max. speed, 165 m.p.h. at sea level; cruising (75% power), 146 m.p.h.; range (66% power), 660 mls. **Dimensions:** Span, 34 ft. 9 in.; length, 26 ft. 4 in.; height, 7 ft. 2⅔ in.; wing area, 146 sq. ft.



SUD-AVIATION (T-28A) FENNEC

The Fennec is an extensively modified version of the North American T-28A basic trainer for close-support duties with the Armée de l'Air in Algeria. Sud-Aviation have converted 135 surplus T-28A trainers to Fennec standards by replacing the 800 h.p. Wright R-1300-1 with a more powerful engine, armouring the forward fuselage and making provision for armament.

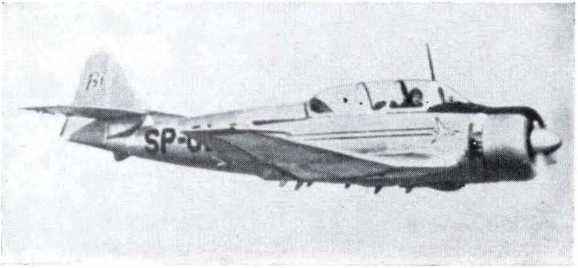
Nationality: Franco-American. **Type:** Two-seat Close-support Aircraft. **Power Plant:** One 1,350 h.p. Wright R-1820-56. **Armament:** Four 12·5-mm. guns and four 297-lb. bombs. **Weights:** Empty, 6,614 lb.; loaded, 9,370 lb. **Performance:** Max. speed, 340 m.p.h.; cruising (65% power), 217 m.p.h. **Dimensions:** Span, 40 ft. 7 in.; length, 32 ft. 10¾ in.; height, 12 ft. 8½ in.; wing area, 271 sq. ft.

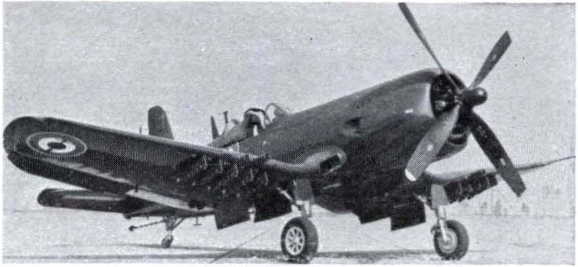


TS-8 BIES

The Bies (Dare-Devil) was flown for the first time on July 23, 1955, and, powered by Poland's first post-war aero engine, was placed in production for the Polish Air Force, deliveries commencing in 1958. The Bies is fully aerobatic and may be fitted with a light machine gun and practice bombs or rocket projectiles for armament training.

Nationality: Polish. **Type:** Two-seat Basic Trainer. **Power Plant:** One 340 h.p. Narkiewicz WN-3 radial. **Weights:** Empty, 2,552 lb.; normal loaded, 3,410 lb.; max., 3,872 lb. **Performance:** Max. speed, 192 m.p.h. at sea level; cruising (75% power), 168 m.p.h.; initial climb, 1,340 ft./min.; ceiling, 20,992 ft.; range, 420 mls. **Dimensions:** Span, 34 ft. 5 in.; length, 27 ft. 10 in.; height, 9 ft. 10 in.; wing area, 212·2 sq. ft.

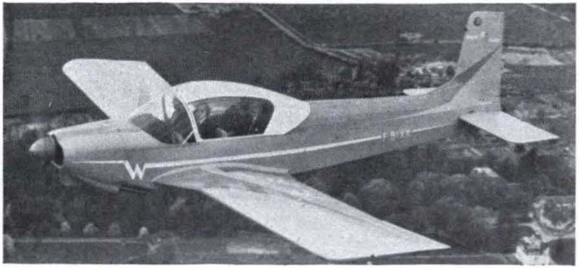




CHANCE VOUGHT F4U-7 CORSAIR

The F4U-7, one of the final production versions of the Corsair of which 12,571 examples were built, currently equips the four close-support and attack squadrons of France's Aéronavale. The earlier F4U-5 equips the sole combat unit of the Salvadorean Air Force, and the Argentine Navy employs F4U-5 and -5N Corsairs. The prototype Corsair, the XF4U-1, flew on May 29, 1940.

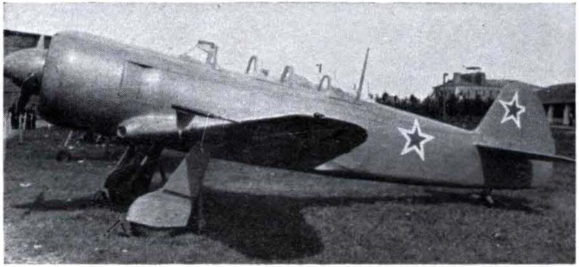
Nationality: American. **Type:** Single-seat Shipboard Fighter-bomber. **Power Plant:** One 2,100 h.p. Pratt and Whitney R-2800-32W radial. **Armament:** Four 20-mm. cannon and max. bomb load of 4,000 lb. **Weights:** Empty, 10,208 lb.; loaded, 13,426 lb. **Performance:** Max. speed, 450 m.p.h. at 26,000 ft. **Dimensions:** Span, 40 ft. 11¾ in.; length, 34 ft. 6½ in.; height, 14 ft. 9¼ in.; wing area, 314 sq. ft.



WASSMER W.A.40 SUPER IV

The W.A.40 Super IV flew for the first time on June 8, 1959, and production deliveries began in June 1960. The basic production model is known as the Super IV Pariou, and a de luxe model is known as the Super IV Baladou. A version basically similar to the Baladou but with I.F.R. instrumentation is known as the Super IV Sancy.

Nationality: French. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A1A engine. **Weights:** Empty, 1,433 lb.; loaded, 2,645 lb. **Performance:** Max. speed, 177 m.p.h.; max. cruising, 165 m.p.h. at 7,875 ft.; econ. cruising, 155 m.p.h.; initial climb, 984 ft./min.; max. endurance, 5 hrs. **Dimensions:** Span, 32 ft. 9½ in.; length, 24 ft. 11⅓ in.; height, 9 ft. 4½ in.; wing area, 172·223 sq. ft.



YAKOVLEV YAK-11 (MOOSE)

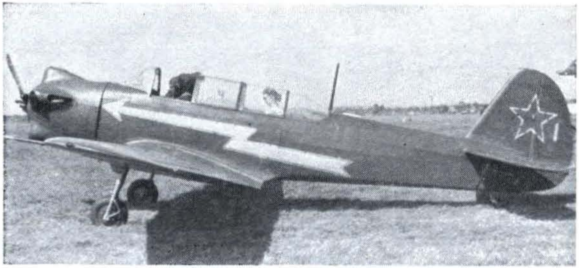
The Yak-11 has been supplied to most communist air arms and has been built under licence in Czechoslovakia as the C.11 with a tailwheel undercarriage and as the C.11U with a nosewheel undercarriage. First flown in 1946, the Yak-11 began to enter service with the Soviet Air Forces late in the following year. This trainer has also been supplied to Austria, and the U.A.R.

Nationality: Russian. **Type:** Two-seat Basic Trainer. **Power Plant:** One 730 h.p. Shvetsov ASh-21 radial. **Weights:** Empty, 4,410 lb.; loaded, 5,512 lb. **Performance:** Max. speed, 264 m.p.h. at sea level, 286 m.p.h. at 7,380 ft.; cruising, 205 m.p.h.; service ceiling, 23,300 ft.; max. range (at econ. cruising), 795 mls.; endurance, 4 hr. 20 min. **Dimensions:** Span, 30 ft. 10 in.; length, 27 ft. 10¾ in.; height, 10 ft. 9¼ in.; wing area, 166 sq. ft.

YAKOVLEV YAK-18 (MAX)

The Yak-18 was designed to replace the UT-2 trainer, also designed by Alexander Yakovlev, and entered service with air force training elements. It was subsequently exported widely, and is currently used by numerous Russian flying schools and clubs. A modified version, designated Yak-18U, has a nosewheel undercarriage, the forward fuselage being lengthened and the main undercarriage members being transferred to the rear spar.

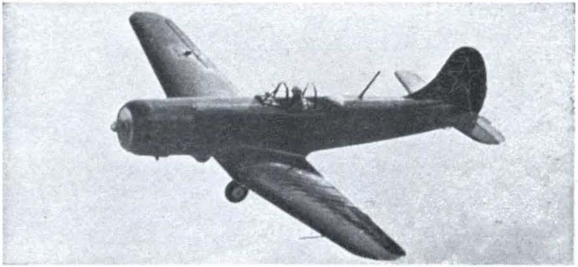
Nationality: Russian. **Type:** Two-seat Primary Trainer. **Power Plant:** One 160 h.p. M-11FR radial. **Weights:** Empty, 1,795 lb.; loaded, 2,470 lb. **Performance:** Max. speed, 153 m.p.h.; cruising, 133 m.p.h.; climb to 3,280 ft., 5 min.; service ceiling, 13,120 ft.; max. range, 620 mls. **Dimensions:** Span, 33 ft. 9½ in.; length, 26 ft. 6 in.; height, 10 ft. 4 in.; wing area, 183 sq. ft.



YAKOVLEV YAK-18P

The Yak-18P is one of two extensively redesigned versions of the basic Yak-18 design which appeared in 1958. Both have the AI-14R engine and are basically similar, the Yak-18A being a tandem two-seater and the Yak-18P, described and illustrated here, being a fully aerobatic single-seater. Structurally, the Yak-18A and P differ little from the Yak-18U, both having nosewheel undercarriages. Both types are being built in quantity.

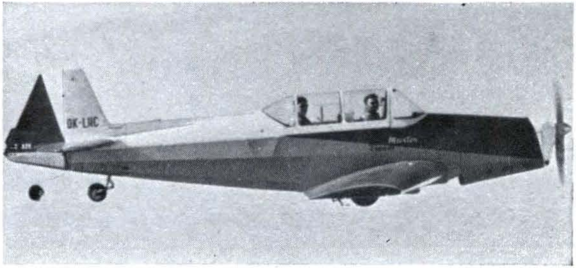
Nationality: Russian. **Type:** Single-seat Aerobatic Trainer. **Power Plant:** One 260 h.p. Ivchenko AI-14R radial. **Weights:** Empty, 2,023 lb.; loaded, 2,347 lb. **Performance:** Max. speed, 171 m.p.h. at sea level; initial climb, 1,968 ft./min.; service ceiling, 20,320 ft. **Dimensions:** Span, 34 ft. 9¼ in.; length, 26 ft. 10 in.; height, 10 ft. 8 in.; wing area, 182·988 sq. ft.

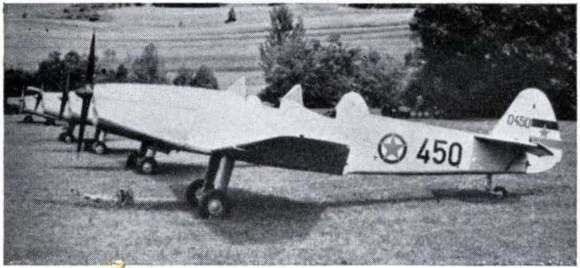


ZLIN Z-326 TRENER-MASTER

The Z-326 is a progressive development of the Z-226T Trener 6 (see page 334) from which it differs primarily in having a retractable undercarriage. The Z-326 was flown for the first time in the Autumn of 1957, and a fully aerobatic single-seat version is known as the Z-326A Akrobat. The Z-326 may be fitted with auxiliary wingtip fuel tanks.

Nationality: Czechoslovakian. **Type:** Two-seat Basic Trainer. **Power Plant:** One 160 h.p. Walter Minor 6-III engine. **Weights:** Empty, 1,415 lb.; loaded, 2,006 lb. **Performance:** Max. speed, 152 m.p.h. at sea level; cruising (70% power), 131 m.p.h.; initial climb, 1,772 ft./min.; service ceiling, 15,750 ft.; range, 404 mls. **Dimensions:** Span, 34 ft. 6⅞ in.; length, 25 ft. 7 in.; height, 6 ft. 9 in.; wing area, 166·84 sq. ft.

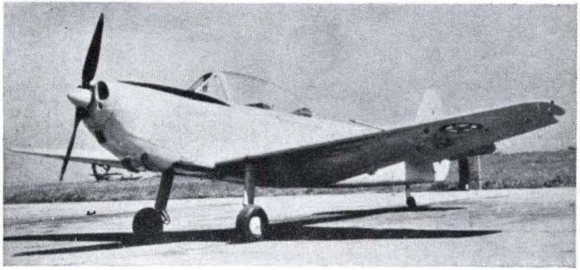




AERO 2D

The Aero 2, the prototype of which was flown for the first time in 1940, did not enter production until after the war, the first production aeroplane flying on October 19, 1946. Several production series followed, including the Aero 2B, 2C and 2F with open cockpits (the Aero 2F being illustrated), and the Aero 2BE, 2E, 2D and 2H with enclosed cockpits. The Aero 2B and 2BE have the 145 h.p. Gipsy Major 10, others having the Minor.

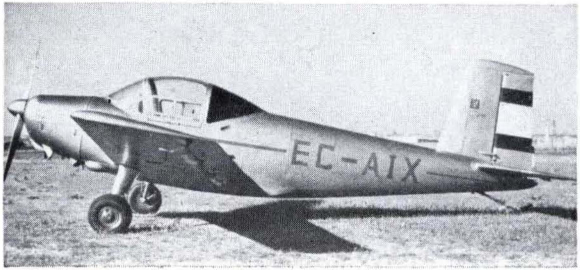
Nationality: Yugoslav. **Type:** Two-seat Primary Trainer. **Power Plant:** One 160 h.p. Walter Minor 6-III engine. **Weights:** Loaded, 2,197 lb. **Performance:** Max. speed, 129 m.p.h.; cruising, 99 m.p.h.; range (at econ. cruising), 423 mls.; service ceiling, 14,764 ft. **Dimensions:** Span, 33 ft. 9½ in.; length, 27 ft. 8¾ in.; height, 8 ft. 10¼ in.



AERO 3

Designed to meet an official specification for a primary trainer to succeed the Aero 2 in Yugoslav Air Force training schools, the Aero 3 flew for the first time in 1956, entering quantity production during the following year. Like its predecessor, the Aero 3 is entirely of wooden construction. Full dual controls are provided, and there is equipment for blind-flying instruction. The Aero 3 is also employed for army co-operation duties.

Nationality: Yugoslav. **Type:** Two-seat Primary Trainer. **Power Plant:** One 190 h.p. Lycoming O-435-A engine. **Weights:** Loaded, 2,641 lb. **Performance:** Max. speed, 143 m.p.h.; econ. cruising, 112 m.p.h.; range (at econ. cruising), 422 mls.; service ceiling, 14,110 ft. **Dimensions:** 34 ft. 5⅜ in.; length, 28 ft. 1¾ in.; height, 8 ft. 10⅛ in.



A.I.S.A. I-11B PEQUE

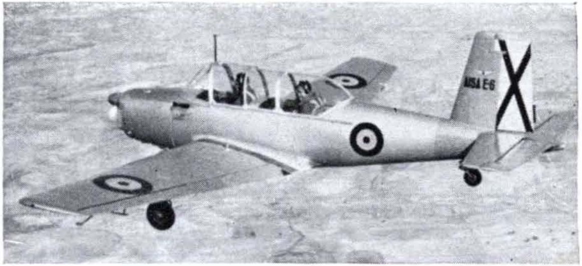
The I-11B Peque is derived from the I-11 which, designed by the Iberavia S.A., flew for the first time in 1950. The I-11B differs from the prototype primarily in having a tailwheel undercarriage in place of the nosewheel arrangement, and first flew on October 16, 1953. The first seventy production aircraft had only basic flying instruments, but the second series of 110 aircraft are fitted with a full blind-flying panel.

Nationality: Spanish. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C90-12F engine. **Weights:** Empty, 926 lb.; loaded, 1,417 lb. **Performance:** Max. speed, 124 m.p.h.; cruising, 110 m.p.h.; initial climb, 726 ft./min.; range, 403 mls. **Dimensions:** Span, 30 ft. 7 in.; length, 21 ft. 3 in.; height, 6 ft. 3 in.; wing area, 144 sq. ft.

A.I.S.A. I-115

Currently the standard primary trainer at Spanish Air Force flying schools, the I-115 was first flown on July 16, 1952 and was the first post-war Spanish aircraft of entirely indigenous design to attain quantity production, some 300 having been delivered. The I-115 is entirely of wooden construction and is generally similar to the Peque described on the opposite page.

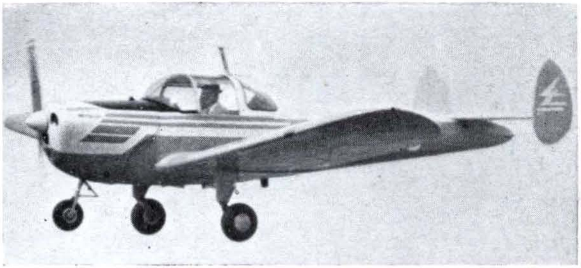
Nationality: Spanish. **Type:** Two-seat Primary Trainer. **Power Plant:** One 150 h.p. E.N.M.A. Tigre G-IV-B engine. **Weights:** Empty, 1,346 lb.; normal loaded, 1,980 lb.; max., 2,180 lb. **Performance:** Max. speed, 143 m.p.h.; cruising, 127 m.p.h.; initial climb, 740 ft./min.; service ceiling, 14,050 ft.; endurance (70% power), 3·5 hrs. **Dimensions:** Span, 31 ft. 3 in.; length, 24 ft. 1 in.; height, 6 ft. 10 in.; wing area, 150·6 sq. ft.



AIRCOUPE EXACTA

The Exacta is the current production model of the Ercoupe which, first flown in October 1937 and designed by the Engineering and Research Corporation, has remained little changed basically. The manufacturing rights in the Ercoupe were acquired by Fornaire Aircraft in April 1955, this concern producing the design as the Aircoupe Explorer, Expediter and Exacta, and production was taken over in 1960 by the Air Products Company.

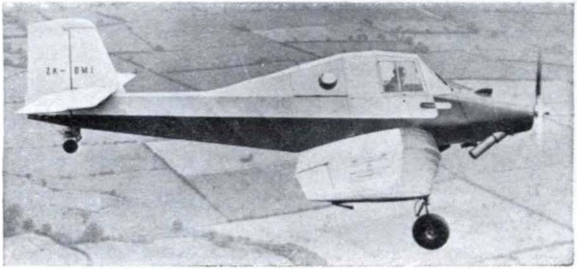
Nationality: American. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C-90-12F engine. **Weights:** Empty, 933 lb.; loaded, 1,450 lb. **Performance:** Max. cruising speed, 120 m.p.h.; initial climb, 700 ft./min.; range, 500 mls. **Dimensions:** Span, 30 ft.; length, 20 ft. 2 in.; height, 6 ft. 3 in.; wing area, 142·6 sq. ft.

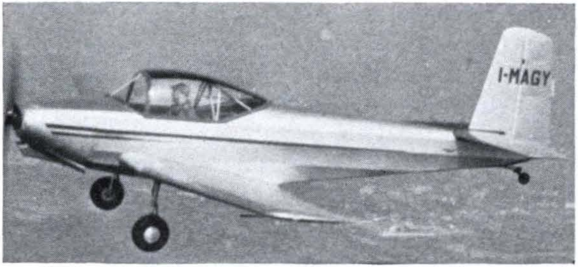


AUSTER B.8 AGRICOLA

Designed specifically for agricultural tasks, the Agricola was flown for the first time on December 8, 1955, and the first batch of fifteen production aircraft was exported to New Zealand. The Agricola can be fitted with a hopper for top-dressing and dusting, with spray tanks, or with both hopper and spray tanks. Metal construction is employed with fabric covering aft of the front wing spar and aft of the hopper filling trunk.

Nationality: British. **Type:** Three-seat Agricultural Aircraft. **Power Plant:** One 240 h.p. Continental O-470-M2 engine. **Weights:** Empty, 1,920 lb.; loaded, 3,675 lb. **Performance:** Max. speed, 127 m.p.h. at 1,000 ft.; econ. cruising, 101 m.p.h.; initial climb, 610 ft./min.; range, 218 mls. **Dimensions:** Span, 42 ft.; length, 28 ft. 1 in.; height, 8 ft. 4 in.; wing area, 254·7 sq. ft.

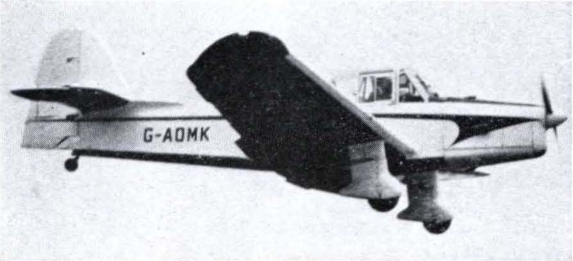




AVIAMILANO P.19 SCRICCIOLO

Winner of a competition for a two-seat trainer to re-equip Italian flying clubs and schools, the P.19 Scricciolo was flown for the first time on December 13, 1959, and the production of an initial series of twenty-five aircraft began in 1960. In addition to the basic trainer version, there are variants of the Scricciolo with a retractable nosewheel undercarriage and a glider-tug version.

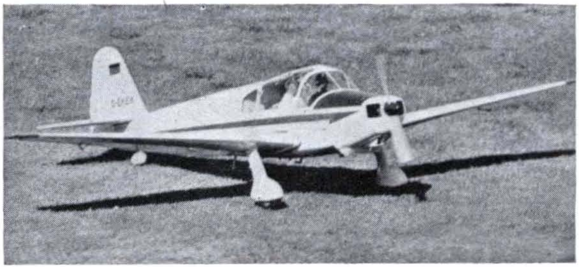
Nationality: Italian. **Type:** Two-seat Trainer. **Power Plant:** One 95 h.p. Continental C90-12F engine. **Weights:** Empty, 882 lb.; loaded, 1,389 lb. **Performance:** Max. speed, 125 m.p.h.; cruising, 109 m.p.h.; initial climb, 700 ft./min.; service ceiling, 17,060 ft.; normal range, 410 mls. at 99 m.p.h., max., 747 mls. **Dimensions:** Span, 33 ft. 7 in.; length, 22 ft. 11 in.; height, 6 ft. 9 in.; wing area, 150·7 sq. ft.



AVIATION TRADERS PRENTICE

Aviation Traders (Engineering) Limited acquired 253 ex-R.A.F. Percival Prentice basic trainers and is converting these for various civil rôles, the principal conversion being a seven-seat tourer. Two hundred Prentices were supplied to Argentina but these have now been replaced by B-45 Mentors. Sixty-two were assembled in India, but these have also now been largely replaced.

Nationality: British. **Type:** Seven-seat Touring Monoplane. **Power Plant:** One 250 h.p. de Havilland Gipsy Queen 32 engine. **Weights:** Empty, 3,150 lb.; loaded, 4,350 lb. **Performance:** Max. speed, 167 m.p.h.; max. cruising, 150 m.p.h.; econ. cruising, 127 m.p.h.; initial climb, 550 ft./min.; range, 805 mls. **Dimensions:** Span, 46 ft.; length, 31 ft. 6½ in.; height, 12 ft. 5½ in.; wing area, 305 sq. ft.



BÖLKOW-KLEMM KL 107C

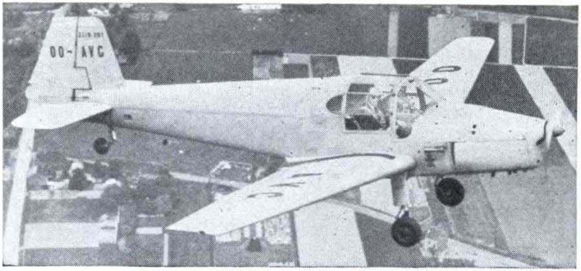
Based on a design evolved during World War II, the Kl 107C is the last production three-seat version of the original Kl 107 which flew for the first time in 1955. The Kl 107C is manufactured by the Bölkow-Entwicklungen but is now being supplanted on the production line by a refined four-seat development, the Bölkow F.207 (originally Kl 107D), which flew on October 10, 1960.

Nationality: German. **Type:** Three-seat Cabin Monoplane. **Power Plant:** One 150 h.p. Lycoming O-320-A2A engine. **Weights:** Empty, 1,377 lb.; loaded, 2,137 lb. **Performance:** Max. speed, 146 m.p.h.; max. cruising, 127 m.p.h.; econ. cruising, 121 m.p.h.; range, 510 mls. at 110 m.p.h. at 3,280 ft.; initial climb, 780 ft./min. **Dimensions:** Span, 35 ft. 6¾ in.; length, 27 ft. 2¾ in.; height, 7 ft. 4½ in.; wing area, 157·153 sq. ft.

BÜCKER BÜ 181 BESTMANN

First produced in 1939 and extensively used by the Luftwaffe during W.W. II, the Bestmann was manufactured under licence in Sweden by A. B. Hagglund and Söner, this concern building 125 Bestmann trainers during 1944–6. It was built in Czechoslovakia after the war as the Zlin Z-281 and Z-381 (illustrated), and production has been undertaken in Egypt as the Gomhouria Mk. 1 (Walter Minor) and Mk. 2 (Continental C145).

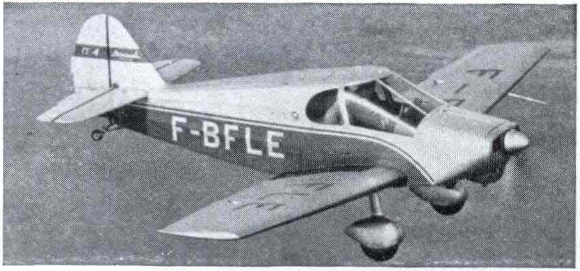
Nationality: German. **Type:** Two-seat Primary Trainer. **Power Plant:** One 105 h.p. Hirth H.M.504 engine. **Weights:** Empty, 1,056 lb.; loaded, 1,650 lb. **Performance:** Max. speed, 150 m.p.h.; cruising, 121 m.p.h.; initial climb, 656 ft./min.; normal range, 355 mls., max., 620 mls. **Dimensions:** Span, 34 ft. 9 in.; length, 25 ft. 5 in.; height, 6 ft. 5 in.; wing area, 145 sq. ft.



C.A.B. GY-20 MINICAB

Produced by Constructions Aéronautiques du Bearn (C.A.B.), the Minicab flew for the first time on February 1, 1949, and was subsequently produced in two versions, the GY-20 and the GY-201, these differing solely in equipment. One Minicab has been fitted with a 90 h.p. Continental engine and is known in this form as the Barritault JB-01.

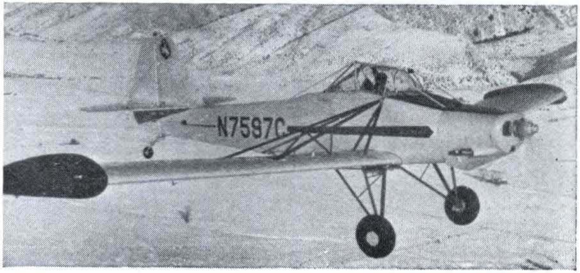
Nationality: French. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 65 h.p. Continental A65-8 engine. **Weights:** Empty, 594 lb.; loaded, 1,067 lb. **Performance:** Max. speed, 124 m.p.h.; max. cruising speed, 105 m.p.h.; initial climb, 590 ft./min.; time to 1,180 ft., 2 min. 10 sec.; service ceiling, 13,120 ft.; range, 466 mls. **Dimensions:** Span, 24 ft. 11 in.; length, 17 ft. 10½ in.; height, 5 ft. 5 in.; wing area, 107·6 sq. ft.

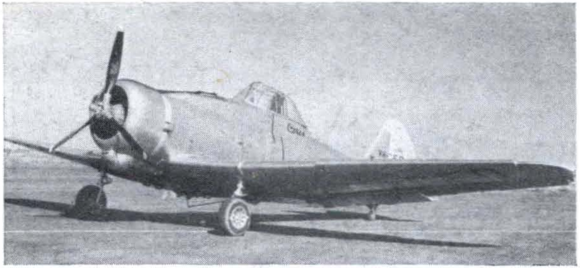


CALLAIR A-6

The Callair Model A was first flown in 1941 and entered production in 1943, the latest development of the basic design being the Model A-6 which first flew on December 18, 1957. Like its predecessor the Model A-5, the A-6 has a simplified structure and specialised equipment for agricultural duties but has a more powerful engine than the 150 h.p. Lycoming O-320-A2A installed in the earlier model.

Nationality: American. **Type:** Two-seat Agricultural Aircraft. **Power Plant:** One 180 h.p. Lycoming O-360-A1A engine. **Weights:** Empty, 1,180 lb.; loaded, 2,350 lb. **Performance:** Max. speed, 107 m.p.h.; cruising (75% power), 83 m.p.h.; initial climb, 765 ft./min.; range, 410 mls. **Dimensions:** Span, 35 ft. 5¼ in.; length, 24 ft. 1 in.; height, 7 ft.; wing area, 186·1 sq. ft.

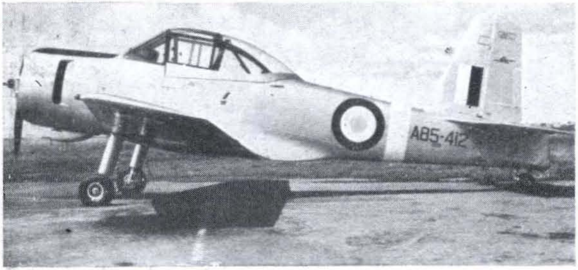




COMMONWEALTH CA-28 CERES

The Ceres has been designed to a large extent around components of the wartime Wirraway trainer, and was flown for the first time during the Summer of 1958 when an initial production series of forty aircraft was initiated. Currently operating in Australia and New Zealand, the Ceres is basically a single-seater but a special aft-facing passenger seat may be installed behind the pilot.

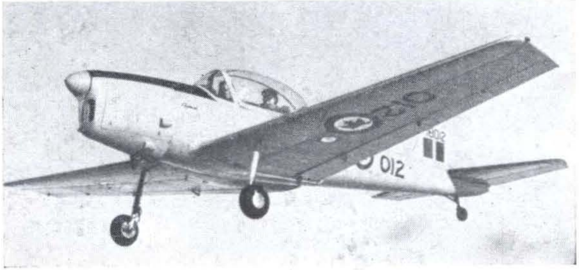
Nationality: Australian. **Type:** Single-seat Agricultural Aircraft. **Power Plant:** One 600 h.p. Pratt and Whitney R-1340 S3H1-G radial. **Weights:** Empty, 4,475 lb.; loaded, 7,410 lb. **Performance:** Operating speed (max. payload), 111 m.p.h.; initial climb, 725 ft./min.; ferry range (with 80 Imp. gal.), 518 mls. **Dimensions:** Span, 46 ft. 11 in.; length, 30 ft. 8½ in.; height, 9 ft.; wing area, 312 sq. ft.



COMMONWEALTH CA-25 WINJEEL

The standard R.A.A.F. basic trainer, the Winjeel (Eagle) was flown for the first time in 1950 under the designation CA-22. It was initially proposed to install the indigenous Commonwealth Cicada engine in late production Winjeels, but this proposal was abandoned. The first of sixty-two production Winjeels flew on February 23, 1955, production deliveries not being completed until early 1958.

Nationality: Australian. **Type:** Three-seat Basic Trainer. **Power Plant:** One 445 h.p. Pratt and Whitney R-985-AN-2 Wasp radial. **Weights:** Empty, 3,289 lb.; loaded, 4,265 lb. **Performance:** Max. speed, 186 m.p.h.; cruising, 165 m.p.h.; initial climb, 1,500 ft./min.; service ceiling, 18,000 ft. **Dimensions:** Span, 38 ft. 7½ in.; length, 28 ft. 0½ in.; height, 9 ft. 1 in.; wing area, 249 sq. ft.



DE HAVILLAND DHC-1 CHIPMUNK

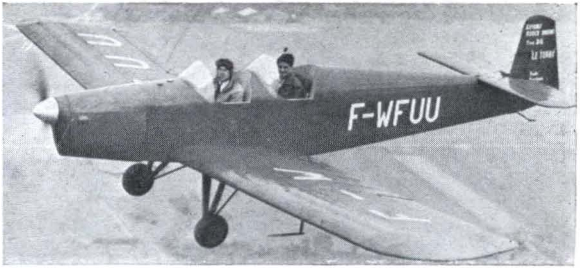
Although the Chipmunk is of Canadian design it has been built in the U.K. as the military Chipmunk T.10 and T.20, and civil Chipmunk T.21. Licence manufacture has also been undertaken in Portugal. Canadian-built Chipmunks are designated T.30 in the R.C.A.F. (illustrated), most of these having a clear-view "blown" cockpit canopy in place of the "glasshouse" structure of British-built machines.

Nationality: Canadian. **Type:** Two-seat Primary Trainer. **Power Plant:** One 145 h.p. de Havilland Gipsy Major 8 engine. **Weights:** Empty, 1,425 lb.; loaded, 2,014 lb. **Performance:** Max. speed, 138 m.p.h.; cruising, 119 m.p.h.; initial climb, 840 ft./min.; range, 280 mls. at 116 m.p.h. **Dimensions:** Span, 34 ft. 4 in.; length, 25 ft. 5 in.; height, 7 ft.; wing area, 172 sq. ft.

DRUINE D.5 TURBI

A two-seat development of the D.3 Turbulent, the Turbi has been built by amateurs throughout the world and is also manufactured in the United Kingdom by Rollason Aircraft and in West Germany by the Flugzeugbau Stark. The Turbi may be fitted with a variety of engines, including the 65 h.p. Continental A65, the 52 h.p. Zundapp, the 62 h.p. Walter Mikron II, the 75 h.p. Régnier, or the 75 h.p. Minié.

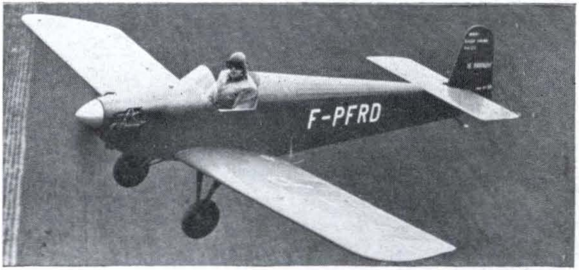
Nationality: French. **Type:** Two-seat Light Monoplane. **Power Plant:** One 45 h.p. Beaussier 4 BO2 engine. **Weights:** Empty, 610 lb.; loaded, 1,090 lb. **Performance:** Max. speed, 96 m.p.h.; cruising, 75 m.p.h.; initial climb, 492 ft./min.; range, 400 mls. at 75 m.p.h. **Dimensions:** Span, 28 ft. 6 in.; length, 22 ft. 6 in.; height, 5 ft. 1 in.; wing area, 145·2 sq. ft.



DRUINE D.3 TURBULENT

The Turbulent ultra-light monoplane was designed for sale in kit form for assembly by amateur constructors, and a large number of Turbulents have been built in various parts of the world. A variety of small engines may be installed, but most aircraft of this type have the 30 h.p. Porsche or Ardem, and many refinements have been added to individual machines, such as blown cockpit canopies.

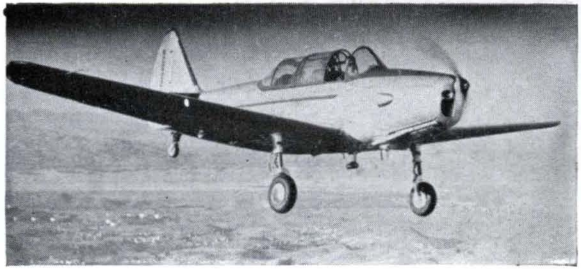
Nationality: French. **Type:** Single-seat Ultra-light Monoplane. **Power Plant:** One 30 h.p. Ardem 4 CO2 engine. **Weights:** Empty, 341 lb.; loaded, 606 lb. **Performance:** Max. speed, 87 m.p.h. at sea level; cruising, 74 m.p.h.; initial climb, 492 ft./min.; endurance, 4 hr. 30 min. **Dimensions:** Span, 21 ft. 5 in.; length, 17 ft. 4½ in.; height, 4 ft. 11 in.; wing area, 80·7 sq. ft.

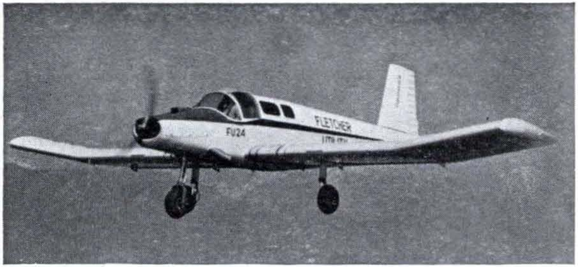


FAIRCHILD M-62A

The M-62A is one of several versions of the basic M-62 design, more than 2,000 examples of which are currently flying. First flown in March 1939, the M-62 was widely used during the war as a primary trainer, the principal versions being the Ranger-powered PT-19 and PT-26, and the PT-23 with the 220 h.p. Continental R-670-4 radial engine. Both Ranger- and Continental-powered models serve with several Latin-American air forces.

Nationality: American. **Type:** Two-seat Primary Trainer. **Power Plant:** One 200 h.p. Ranger L-440-7 engine. **Weights:** Empty, 2,022 lb.; loaded, 2,741 lb. **Performance:** Max. speed, 125 m.p.h.; cruising, 114 m.p.h.; initial climb, 675 ft./min.; range, 450 mls. **Dimensions:** Span, 36 ft. 11¼ in.; length, 27 ft. 11¾ in.; height, 7 ft. 6 in.; wing area, 200 sq. ft.

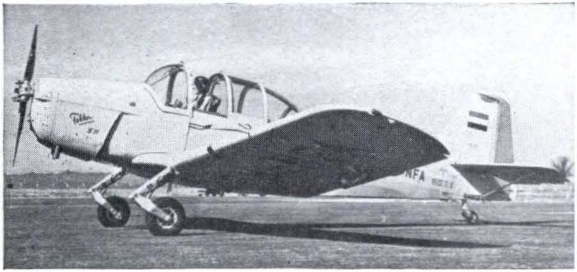




FLAIR FU-24 UTILITY

The FU-24 Utility, produced by Flair Aviation (originally Fletcher Aviation), was designed primarily for agricultural work in New Zealand where 100 machines of this type have been assembled. First flown on June 14, 1954, the FU-24 is of all-metal construction and is treated with a special plastic paint to eliminate the corrosive effects of the chemicals that it carries for top-dressing operations.

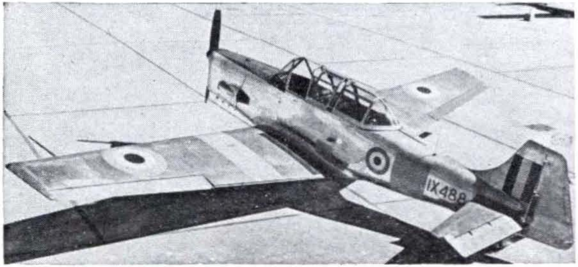
Nationality: American. **Type:** Single-seat Agricultural Aircraft. **Power Plant:** One 240 h.p. Continental O-470-N engine. **Weights:** Empty, 1,890 lb.; loaded, 3,910 lb. **Performance:** Max. speed, 138 m.p.h.; cruising, 111 m.p.h.; initial climb, 745 ft./min.; service ceiling, 14,780 ft. **Dimensions:** Span, 42 ft.; length, 31 ft. 10 in.; height, 9 ft. 4 in.; wing area, 294 sq. ft.



FOKKER S.11 INSTRUCTOR

The S.11 Instructor was flown for the first time in 1947, and forty trainers of this type were delivered to the R.Neth.A.F. Forty-one were supplied to the Israeli Defence Force/Air Force; 150 were manufactured under licence in Italy as the Macchi M.416, and one hundred were manufactured in Brazil for the Brazilian Air Force.

Nationality: Dutch. **Type:** Two-seat Primary Trainer. **Power Plant:** One 190 h.p. Lycoming O-435-A engine. **Weights:** Empty, 1,806 lb.; loaded, 2,422 lb. **Performance:** Max. speed, 130 m.p.h. at sea level; cruising, 102 m.p.h.; time to 3,300 ft., 4·4 min.; service ceiling, 13,100 ft.; endurance, 3·55 hr. **Dimensions:** Span, 36 ft. 1 in.; length, 26 ft. 8 in.; height, 7 ft. 5 in.; wing area, 199 sq. ft.



HINDUSTAN HT-2

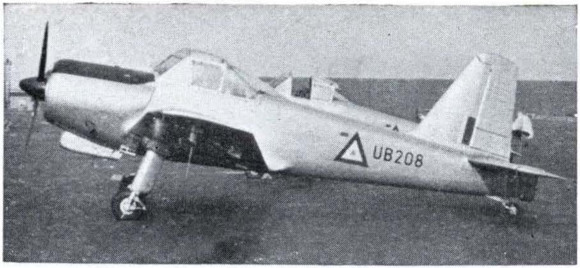
The HT-2 was India's first powered aircraft of indigenous design and is currently the standard Indian Air Force primary trainer. One example of the HT-2 was presented to the Indonesian Air Force, and twelve were delivered to the Ghanaian Air Force. The HT-2 was flown for the first time on August 13, 1951, with a 145 h.p. Gipsy Major 10, the second prototype following on February 19, 1952, with a 155 h.p. Cirrus Major III.

Nationality: Indian. **Type:** Two-seat Primary Trainer. **Power Plant:** One 155 h.p. Blackburn Cirrus Major III engine. **Weights:** Empty, 1,540 lb.; loaded, 2,240 lb. **Performance:** Max. speed, 130 m.p.h.; cruising, 115 m.p.h.; initial climb, 800 ft./min.; ceiling, 16,500 ft.; range, 350 mls. **Dimensions:** Span, 35 ft. 2 in.; length, 24 ft. 8½ in.; height, 8 ft. 11 in.; wing area, 173·4 sq. ft.

HUNTING PROVOST T.1

Currently serving with the R.A.F.'s Nos. 1, 6, and 8 Flying Training Schools and the Central Flying School, the Provost was flown for the first time on February 23, 1950, and 461 had been built when production terminated early in 1960. These included several export versions, including the T.51 for Eire, the T.52 for Rhodesia, and the T.53 for Eire, Burma, Iraq, and Sudan. The T.52 and 53 carry light armament.

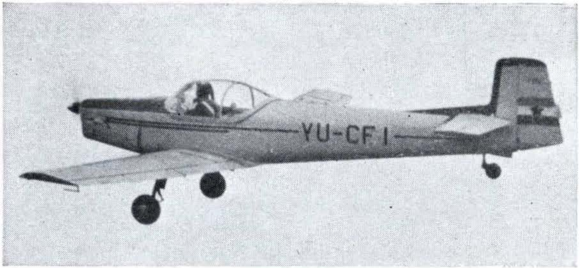
Nationality: British. **Type:** Two-seat basic trainer. **Power Plant:** One 550 h.p. Alvis Leonides 25 radial. **Weights:** Empty, 3,350 lb.; loaded, 4,400 lb. **Performance:** Max. speed, 200 m.p.h. at 2,300 ft.; econ. cruising, 177 m.p.h. at 11,500 ft.; initial climb, 2,200 ft./min. **Dimensions:** Span, 35 ft. 2 in.; length, 28 ft. 8 in.; height, 12 ft. 2½ in.; wing area, 214 sq. ft.



L.K.B. KB-6 MATAJUR

Designed by the Letalski Konstrukeijski Biro (L.K.B.), the KB-6 Matajur was flown for the first time on June 4, 1952, and has since been built in some numbers for club use. A three-seat version with a 160 h.p. Yugoslav-built Walter Minor 6-III is known as the KB-6 Matajur-Trised.

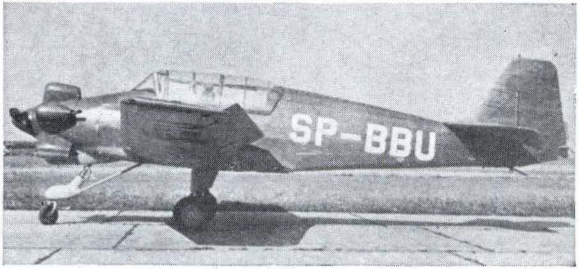
Nationality: Yugoslav. **Type:** Two-seat Touring and Training Monoplane. **Power Plant:** One 136 h.p. Régnier 4L00 engine. **Weights:** Empty, 1,453 lb.; loaded, 2,159 lb. **Performance:** Max. speed, 138 m.p.h. at sea level; max. cruising, 124 m.p.h.; initial climb, 689 ft./min.; service ceiling, 14,800 ft.; range (at economical cruising speed), 510 mls.; endurance, 5 hrs. **Dimensions:** Span, 34 ft. 9 in.; length, 27 ft. 5 in.; height, 7 ft. 1 in.; wing area, 150·7 sq. ft.

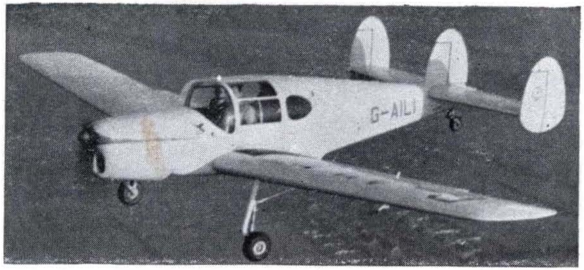


L.W.D. JUNAK 3

The Junak series of primary trainers was initiated in 1947 specifically to meet the needs of Polish aero clubs, and the Junak 1 flew for the first time on February 2, 1948. The production model was designated Junak 2, deliveries commencing in 1954. The Junak 3 differed from its predecessor primarily in having a fixed nosewheel undercarriage, and this model was delivered to both the Polish Air Force and the aero clubs.

Nationality: Polish. **Type:** Two-seat Primary Trainer. **Power Plant:** One 160 h.p. M-11FR radial. **Weights:** 1,803 lb.; loaded, 2,381 lb. **Performance:** Max. speed, 127 m.p.h.; cruising, 112 m.p.h.; initial climb, 689 ft./min.; service ceiling, 13,450 ft.; endurance, 2·5 hrs. **Dimensions:** Span, 32 ft. 9¾ in.; length, 25 ft. 5 in.; height, 8 ft. 2½ in.; wing area, 188·368 sq. ft.

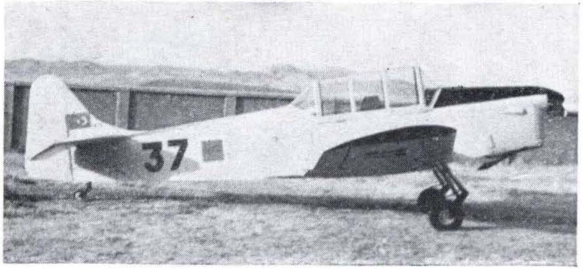




MILES M.38 MESSENGER 2A

Derived from the M.28 Mercury, the M.38 Messenger was produced in small numbers as a communications aircraft for the R.A.F., and almost all of these were disposed of to private owners as the Messenger 4A. Aircraft built from the outset to civil standards were designated Messenger 2, the 2A and 2B having the 155 h.p. Blackburn Cirrus Major 3, and the 2C having the 145 h.p. Gipsy Major ID. Sixty Messengers were built.

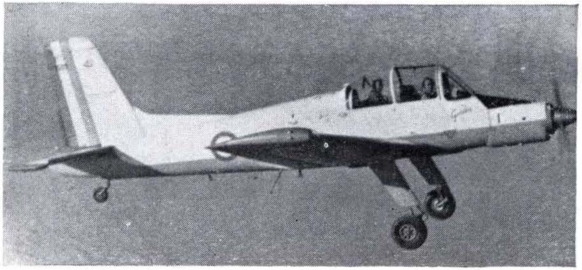
Nationality: British. **Type:** Three-seat Cabin Monoplane. **Power Plant:** One 155 h.p. Blackburn Cirrus Major 3 engine. **Weights:** Empty, 1,450 lb.; loaded, 2,400 lb. **Performance:** Max. speed, 135 m.p.h.; cruising, 124 m.p.h.; initial climb, 950 ft./min.; ceiling, 16,000 ft.; range, 460 mls. **Dimensions:** Span, 36 ft. 2 in.; length, 24 ft.; height, 7 ft. 6 in.; wing area, 191 sq. ft.



M.K.E.K.4 UGUR

The Ugur (Luck) was built in some numbers for the Turkish Air Force primary training schools to replace the licence-built Miles M.14 Hawk Trainer III. The Ugur retains a substantial proportion of the Hawk Trainer's structure. Examples of the Ugur were presented to the Royal Jordanian Air Force although these are no longer in use.

Nationality: Turkish. **Type:** Two-seat Primary Trainer. **Power Plant:** One 145 h.p. de Havilland Gipsy Major 10 Mk.1 engine. **Weights:** Empty, 1,465 lb.; loaded, 2,045 lb. **Performance:** Max. speed, 135 m.p.h.; cruising, 110 m.p.h.; initial climb, 800 ft./min.; service ceiling, 16,000 ft.; range (75% power), 300 mls. **Dimensions:** Span, 31 ft. 2½ in.; length, 24 ft. 7¼ in.; height, 7 ft.; wing area, 171 sq. ft.

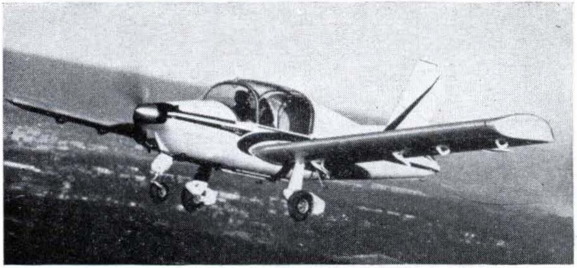


MORANE-SAULNIER M.S.1500 EPERVIER

The Epervier (Hawk) was designed as an inexpensive multi-purpose military aircraft suitable for use in limited campaigns such as that waged by French forces in Algeria. The first prototype was flown on May 12, 1958, powered by a 400 s.h.p. Turboméca Mareadau turboprop, this later being supplanted by the more powerful Bastan which also powers the second prototype. No production orders have been placed but trials are continuing.

Nationality: French. **Type:** Two-seat Multi-purpose Military Aircraft. **Power Plant:** One 870 s.h.p. Turboméca Bastan 2C turboprop. **Weights:** Empty, 3,660 lb.; loaded, 6,283 lb. **Performance:** Max. speed, 240 m.p.h.; cruising, 220 m.p.h. **Dimensions:** Span, 42 ft. 10 in.; length, 34 ft. 8½ in.; height, 10 ft. 10 in.; wing area, 258·334 sq. ft.

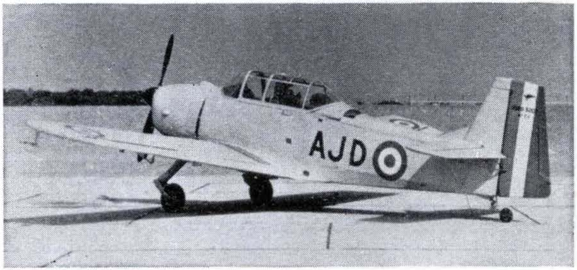
MORANE-SAULNIER M.S.880 RALLYE-CLUB



The Rallye-Club is one of nine types designed to compete in the official French contest for an *aéronef de grande vulgarisation*, and possesses an extremely simple all-metal structure. The Rallye-Club may be fitted with Continental engines of either 90 or 100 h.p., and a further development of the basic design, the M.S.885 Super-Rallye, is fitted with a 145 h.p. Continental. A production rate of thirty per month was anticipated by mid-1961.

Nationality: French. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 100 h.p. Continental O-200-A engine. **Weights:** Empty, 970 lb.; loaded, 1,653 lb. **Performance:** Max. speed, 124 m.p.h.; cruising, 112 m.p.h.; initial climb, 590 ft./min. **Dimensions:** Span, 30 ft. 4⅓ in.; length, 22 ft. 6¾ in.; height, 8 ft. 10¼ in.; wing area, 132·396 sq. ft.

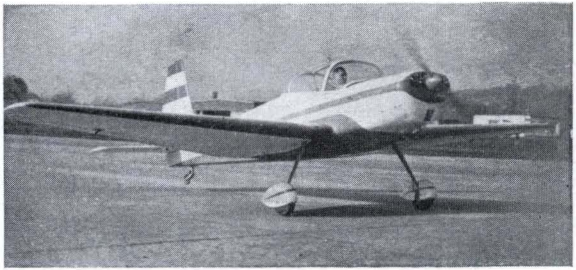
NORD 3202



Selected as the standard primary trainer for France's A.L.A.T. schools, the Nord 3202 flew for the first time on April 17, 1957, and 100 machines were ordered, the bulk of which had been delivered by mid-1961. Possessing a levered-suspension undercarriage, the Nord 3202 is of all-metal construction with fabric-covered rear fuselage and wings.

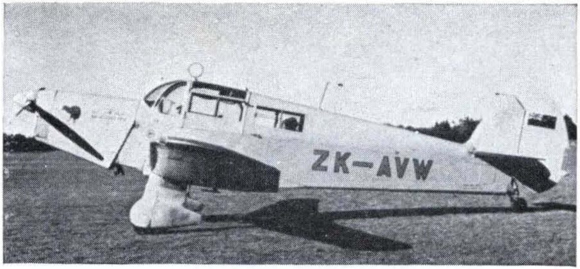
Nationality: French. **Type:** Two-seat Primary Trainer. **Power Plant:** One 240 h.p. Potez 4D.32 engine. **Weights:** Empty, 1,813 lb.; loaded, 2,689 lb. **Performance:** Max. speed, 161 m.p.h. at sea level; max. cruising, 155 m.p.h. at 4,265 ft., 146 m.p.h. at 7,545 ft.; initial climb, 1,181 ft./min.; normal range, 620 mls. **Dimensions:** Span, 31 ft. 2 in.; length, 26 ft. 7¾ in.; height, 9 ft. 3 in.; wing area, 175·02 sq. ft.

OBERLERCHNER JOB 5



The first powered aircraft to be produced by the Josef Oberlerchner company which, founded in 1940, has built some 4,000 gliders, the JOB 5 is of simple wooden construction, although it is proposed to introduce a fabric-covered steel-tube fuselage, and later models will be fitted with a nosewheel undercarriage, these having a 135 h.p. Lycoming O-290-D2B engine.

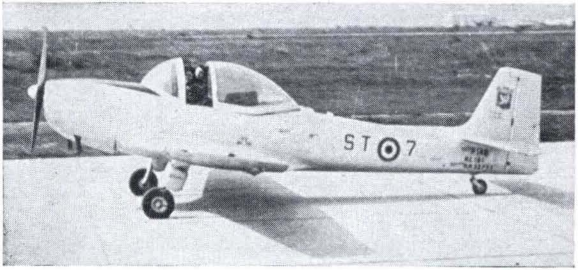
Nationality: Austrian. **Type:** Two/three-seat Cabin Monoplane. **Power Plant:** One 95 h.p. Continental C90-12F engine. **Weights:** (Two-seater) Empty, 944 lb.; loaded, 1,350 lb. **Performance:** Max. speed, 112 m.p.h.; cruising, 99 m.p.h.; initial climb, 787 ft./min.; service ceiling, 18,040 ft.; range, 398 mls.; endurance, 4·1 hrs. **Dimensions:** Span, 33 ft. 1¾ in.; length, 24 ft. 7¼ in.; height, 6 ft. 7¾ in.; wing area, 158·229 sq. ft.



PERCIVAL P.44 PROCTOR 5

Originally a strengthened version of the Vega Gull III built to an Air Ministry specification, the Proctor flew on October 8, 1939, and 878 Proctors I, II and III were built before the introduction of the entirely redesigned Proctor IV, 258 examples of which were produced. Basically similar to the Proctor IV, the Proctor 5 was a purely civil version, 150 being built.

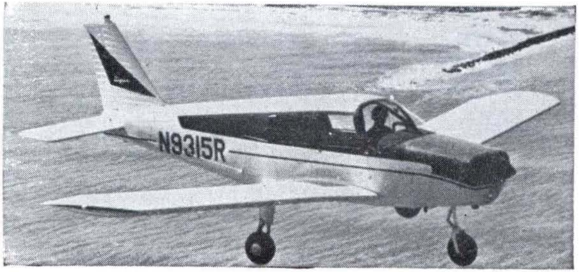
Nationality: British. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 208 h.p. de Havilland Gipsy Queen II engine. **Weights:** Empty, 2,450 lb.; loaded, 3,500 lb. **Performance:** Max. speed, 157 m.p.h.; cruising, 135 m.p.h.; initial climb, 680 ft./min.; service ceiling, 14,000 ft.; range (at econ. cruising), 480 mls. **Dimensions:** Span, 39 ft. 6 in.; length, 28 ft. 2 in.; height, 7 ft. 3 in.; wing area, 202 sq. ft.



PIAGGIO P.148

Flown for the first time on February 12, 1951, the P.148 was ordered for the Italian Air Force and the first of 100 production machines flew in June 1952. The P.148 is normally flown as a two-seater but is certificated as a three-seater. Of all-metal construction and exceptionally clean design, the P.148 is very similar to the P.149 (page 315) which uses many of the same structural components.

Nationality: Italian. **Type:** Two-seat Primary Trainer. **Power Plant:** One 190 h.p. Lycoming O-435-A engine. **Weights:** Empty, 1,931 lb.; loaded, 2,645 lb. **Performance:** Max. speed, 145 m.p.h. at sea level; cruising, 127 m.p.h. at 2,950 ft.; initial climb, 900 ft./min. **Dimensions:** Span, 36 ft. 5¾ in.; length, 27 ft. 8¼ in.; height, 7 ft. 10½ in.; wing area, 202·5 sq. ft.



PIPER PA-28 CHEROKEE

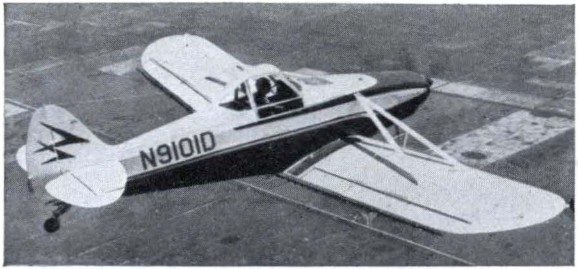
First announced in November 1960, the PA-28 Cherokee is a low-cost four-seat cabin monoplane, deliveries of which commenced in the Spring of 1961. Only 1,200 parts go into the manufacture of the Cherokee as compared with 1,600 for the Tri-Pacer, accent having been placed on design and construction simplicity. Versions of the Cherokee with 150 h.p. and 180 h.p. engines are currently under consideration.

Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 160 h.p. Lycoming O-320-B engine. **Weights:** Empty, 1,195 lb.; loaded, 2,200 lb. **Performance:** Max. speed, 138 m.p.h.; cruising, 132 m.p.h. at 7,000 ft.; initial climb, 700 ft./min.; range (55% power), 650 mls. **Dimensions:** Span, 30 ft.; length, 23 ft. 3½ in.; height, 7 ft. 3½ in.; wing area, 160 sq. ft.

PIPER PA-25 PAWNEE

The Pawnee has been designed specifically for agricultural duties, and production deliveries commenced in August 1959. The fuselage is so designed that, in a low-speed crash of the type usually associated with crop-spraying, the fuselage will fail progressively from the front to reduce the deceleration of the cockpit. All heavy objects or loads are forward of the cockpit.

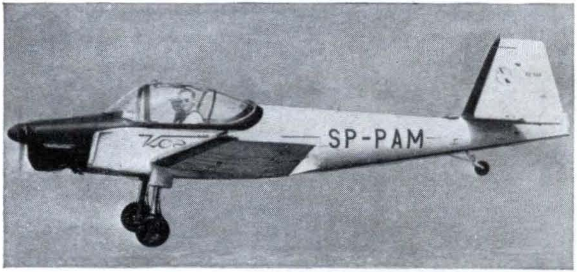
Nationality: American. **Type:** Single-seat Agricultural Aircraft. **Power Plant:** One 150 h.p. Lycoming O-320 engine. **Weights:** Empty, 1,200 lb.; loaded, 2,300 lb. **Performance:** Max. speed, 100 m.p.h.; cruising, 90 m.p.h.; initial climb, 510 ft./min.; service ceiling, 10,000 ft.; range (at 75% power), 400 mls. **Dimensions:** Span, 36 ft. 2½ in.; length, 24 ft.; height, 6 ft. 9½ in.; wing area, 183 sq. ft.



PZL-102B KOS

The Kos (Blackbird) was first flown on May 21, 1958, with a 65 h.p. Narkiewicz WN-1 engine, but the production model, the PZL-102B, has standardised on the more powerful Continental engine. The Kos is of all-metal construction with side-by-side seats and dual controls. Production deliveries began in 1960.

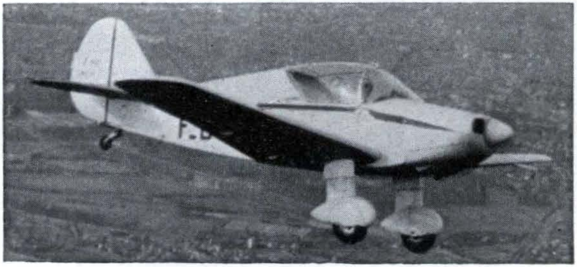
Nationality: Polish. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C-90-12F engine. **Weights:** Empty, 890 lb.; loaded, 1,390 lb. **Performance:** Max. speed, 120 m.p.h.; cruising, 108 m.p.h.; initial climb, 310 ft./min.; service ceiling, 15,100 ft.; time to 3,300 ft., 4 min. 20 sec.; range, 400 mls. at 102 m.p.h.; endurance, 4 hr. 15 min.; max. diving speed, 187 m.p.h. **Dimensions:** Span, 27 ft. 9 in.; length, 22 ft. 10 in.; height, 6 ft. 2 in.; wing area, 119 sq. ft.

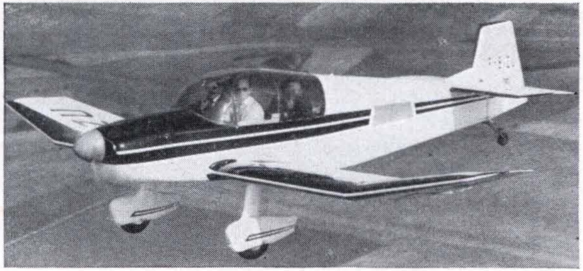


S.I.P.A.901

Designed to participate in a government-sponsored competition for two-seat light touring aircraft, the S.I.P.A.901 was flown for the first time on June 25, 1948. One hundred machines were produced for government-sponsored schools, and a number of experimental versions were tested with Continental, Salmson and Mathis engines of 75–100 h.p.

Nationality: French. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 75 h.p. Minié 4 DC-30 or DC-32 engine. **Weights:** Empty, 805 lb.; loaded, 1,320 lb. **Performance:** Max. speed, 124 m.p.h.; cruising, 109 m.p.h.; initial climb, 492 ft./min.; service ceiling, 13,120 ft.; range (at econ. cruising), 310 mls. **Dimensions:** Span, 28 ft. 8 in.; length, 18 ft. 10½ in.; height, 5 ft. 9 in.; wing area, 120·5 sq. ft.

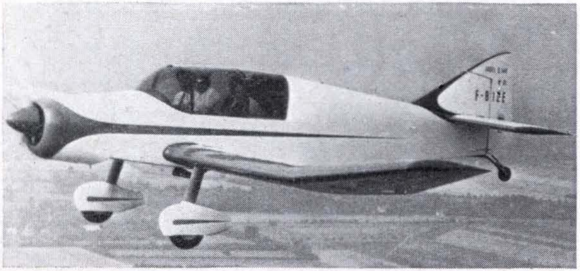




S.A.N. JODEL DR.100 AMBASSADEUR

A three-seater derived from the original two-seat Jodel D.11, the DR.100 Ambassadeur is manufactured by the Société Aeronautique Normande. Variants of the basic design produced by the Centre Est Aéronautique are the DR.105 and DR.1050 with the 100 h.p. Continental O-200-A engine, the latter having modified fuel system and instrumentation.

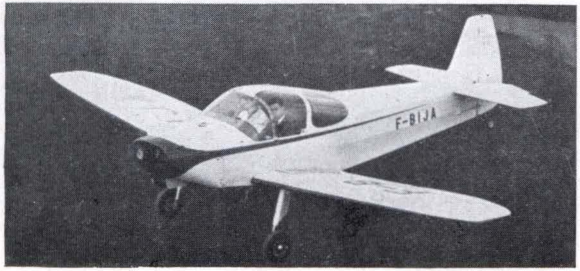
Nationality: French. **Type:** Three-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C90-14F engine. **Weights:** Empty, 926 lb.; loaded, 1,653 lb. **Performance:** Max. speed, 130 m.p.h.; max. cruising, 121 m.p.h.; econ. cruising, 112 m.p.h.; initial climb, 590 ft./min.; service ceiling, 14,760 ft.; max. range, 620 mls. **Dimensions:** Span, 28 ft. 7⅓ in.; length, 21 ft. 3 in.; height, 5 ft. 9¾ in.; wing area, 146·389 sq. ft.



S.A.N. JODEL D.140 MOUSQUETAIRE

Like the previously described Ambassadeur, the Mousquetaire has been developed from the two-seat Jodel D.11 series (the Société Aeronautique Normande having previously manufactured the two-seat D.117 Grand Tourisme). The prototype Mousquetaire was flown for the first time on July 4, 1958, a production rate of 10–12 aircraft per month being attained in 1960.

Nationality: French. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A2A engine. **Weights:** Empty, 1,323 lb.; loaded, 2,535 lb. **Performance:** Max. speed, 161 m.p.h.; cruising, 143 m.p.h.; initial climb, 985 ft./min.; service ceiling, 14,760 ft.; range, 808 mls. at 141 m.p.h.; max. endurance, 6 hrs. **Dimensions:** Span, 33 ft. 5½ in.; length, 25 ft. 11 in.; height, 7 ft.; wing area, 193·75 sq. ft.



SCINTEX CP.301C ÉMERAUDE

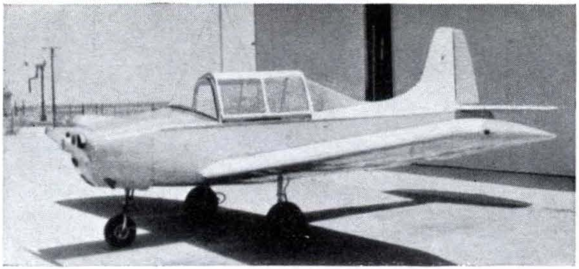
The CP.301C is the Seintex-built version of the Piel CP.30 Émeraude, the prototype of which flew in 1952. Piel Aviation have produced the CP.30 with a 65 h.p. Continental, the CP.301A with the 90 h.p. Continental, and the CP.302 with the 90 h.p. Salmson. The CP.301C incorporates detail improvements. Garland Aircraft plan to produce an anglicised model as the Linnet; it is manufactured in South Africa as the Genair Aerial 2, and production is undertaken in Germany by Schemp-Hirth.

Nationality: French. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C90-12F. **Performance:** Max. speed, 130 m.p.h.; cruising, 112 m.p.h. **Weights:** Empty, 871 lb.; loaded, 1,433 lb. **Dimensions:** Span, 27 ft.; length, 20 ft. 1 in.; height, 5 ft. 10¾ in.; wing area, 118·4 sq. ft.

SHINN 2150A

The Shinn 2150A (originally known as the Morrisey 2150) entered production in June 1958 with Morrisey Aviation Inc., but after the completion of a small series of aircraft, manufacturing and sales rights were acquired by Shinn Engineering, production being resumed in April 1961. The Shinn 2150A embodies a number of refinements over the original model.

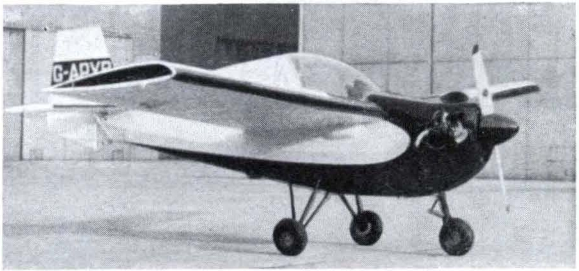
Nationality: American. **Type:** Two-seat Utility Monoplane. **Power Plant:** One 150 h.p. Lycoming O-320-A1A engine. **Weights:** Empty, 1,125 lb.; loaded, 1,817 lb. **Performance:** Max. speed, 148 m.p.h.; cruising, 135 m.p.h.; initial climb, 1,450 ft./min.; service ceiling, 22,000 ft.; range (at econ. cruising), 525 mls. **Dimensions:** Span, 30 ft.; length, 21 ft. 3 in.; height, 7 ft.; wing area, 144 sq. ft.



TIPSY T.66 NIPPER MK. 2

Manufactured by Avions Fairey S.A., the Nipper is intended mainly for sale in kit form although it is also supplied as a ready-to-fly aircraft. First flown on December 2, 1957, the Nipper was initially produced as the T.66 Mk. 1 with a 40 h.p. Pollmann HEPU engine, but the T.66 Mk. 2, which first flew on February 16, 1959, has the more powerful Stark Stamo. The first production Mk. 2 aircraft was flown on October 20, 1959.

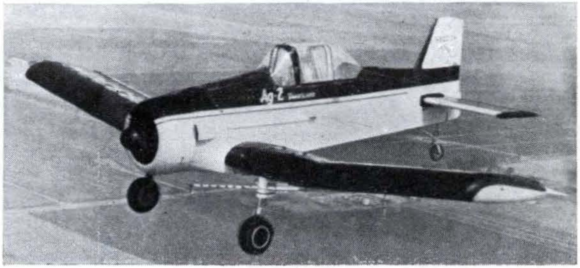
Nationality: Belgian. **Type:** Single-seat Ultra-light Monoplane. **Power Plant:** One 45 h.p. Stark Stamo 1400A engine. **Weights:** Empty, 412 lb.; loaded, 660 lb. **Performance:** Max. speed, 101 m.p.h.; max. cruising, 93 m.p.h.; econ. cruising, 84 m.p.h.; initial climb, 630 ft./min.; range, 200 mls. **Dimensions:** Span, 19 ft. 8 in.; length, 15 ft.; height, 6 ft. 2 in.; wing area, 80·7 sq. ft.

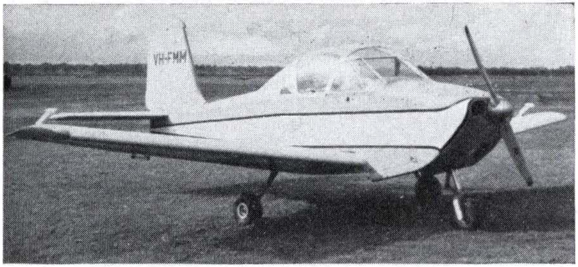


TRANSLAND AG-2

Designed specifically for agricultural duties, the Ag-2 first flew on October 11, 1956, development having begun in 1952. Initially powered by a 450 h.p. Pratt and Whitney R-985 engine, it was later re-engined with an R-1340 which powers the production model. The Ag-2 may be fitted with two dispensing methods, the Swathmaster which dispenses liquid or dry chemicals, seed or pellets, and the Liquid Spray System patterned after the hopper-pump-boom system.

Nationality: American. **Type:** Single-seat Agricultural Monoplane. **Power Plant:** One 600 h.p. Pratt and Whitney R-1340 S3H1 Wasp radial. **Weight:** Loaded, 7,700 lb. **Performance:** Max. speed, 142 m.p.h.; cruising, 130 m.p.h. **Dimensions:** Span, 42 ft.; length, 28 ft. 5 in.; height, 9 ft. 8 in.; wing area, 321·6 sq. ft.

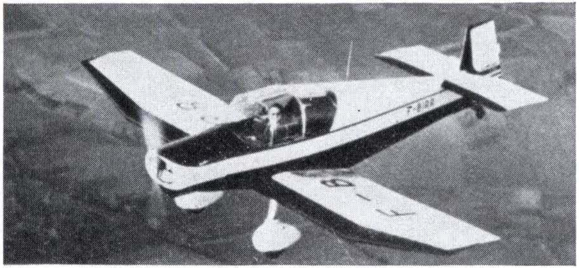




VICTA AIR TOURER

Derived from the Henry Millicer design which won the Royal Aero Club's 1953 competition, the Air Tourer has been placed in production by Victa Consolidated Industries. The original prototype (to which the specification applies) has a 65 h.p. Continental engine with which it flew on March 31, 1959, but Victa-built production Air Tourers have a 95 h.p. Continental.

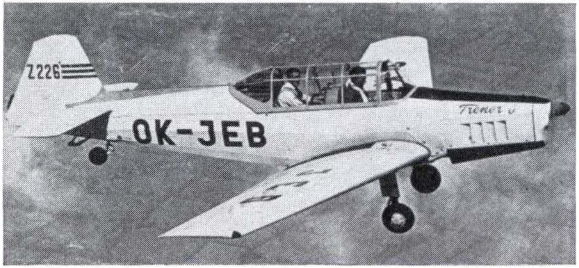
Nationality: Australian. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 65 h.p. Continental A-65 engine. **Weights:** Empty, 615 lb.; loaded, 1,200 lb. **Performance:** Max. speed, 124 m.p.h.; max. cruising, 105 m.p.h.; econ. cruising, 95 m.p.h.; initial climb, 630 ft./min.; normal range, 500 mls.; max. range, 800 mls. **Dimensions:** Span, 26 ft.; length, 20 ft. 10 in.; height, 6 ft. 10 in.; wing area, 120 sq. ft.



WASSMER-JODEL D.120 PARIS-NICE

Like the Ambassadeur and Mousquetaire described on page 332, the Paris-Nice stems from the original Jodel D.11 and is, in fact, a de luxe version of the D.112, but is not intended for construction by amateurs. The prototype D.120 Paris-Nice flew on June 5, 1955, quantity production commencing in 1958, since which year a substantial number of machines have been produced for France and export.

Nationality: French. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 95 h.p. Continental C90-12F engine. **Weights:** Empty, 792 lb.; loaded, 1,433 lb. **Performance:** Max. speed, 127 m.p.h.; cruising (75% power), 118 m.p.h.; initial climb, 690 ft./min.; range, 621 mls. **Dimensions:** Span, 27 ft.; length, 20 ft. 10 in.; height, 5 ft. 9 in.; wing area, 132 sq. ft.



ZLIN Z-226T TRENER 6

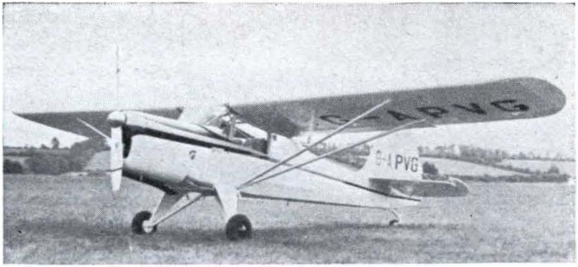
Derived from the Z-26 and Z-126 training monoplanes by way of the Z-226B Bohatyr (Hero) glider tug, the Trener 6 has a more powerful engine than earlier trainers in the series and, unlike the original Z-26 Trener 1, is of all-metal construction. A single-seat aerobatic model is known as the Z-226A Akrobat. The Trener 6 should be compared with the Trener-Master described and illustrated on page 319.

Nationality: Czechoslovak. **Type:** Two-seat Basic Trainer. **Power Plant:** One 160 h.p. Walter Minor 6-III engine. **Weights:** Empty, 1,257 lb.; loaded, 1,808 lb. **Performance:** Max. speed, 137 m.p.h.; cruising, 121 m.p.h.; initial climb, 950 ft./min.; range, 300 mls. **Dimensions:** Span, 33 ft. 9 in.; length, 25 ft. 7 in.; height, 6 ft. 9 in.; wing area, 160·38 sq. ft.

AUSTER J5L AIGLET

The Aiglet first appeared in its J5F form in 1951, being a dual-control aerobatic version of the J1B which was a modified Autocrat with a redesigned tail. The J5K and J5L Aiglets appeared in 1954, being two/three-seat trainer-tourers powered by the 155 h.p. Cirrus Major 3 and the 145 h.p. Gipsy Major 10 respectively. The J5F has the 130 h.p. Gipsy Major 1.

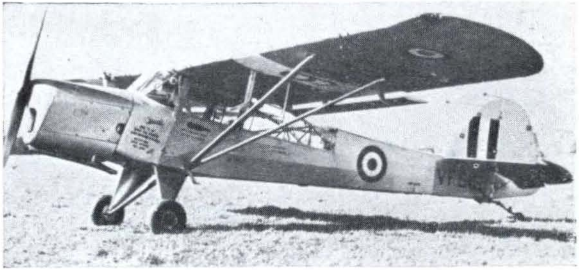
Nationality: British. **Type:** Two/three-seat Training and Touring Monoplane. **Power Plant:** One 145 h.p. de Havilland Gipsy Major 10/2 engine. **Weights:** Empty, 1,323 lb.; loaded, 2,200 lb. **Performance:** Max. speed, 129 m.p.h.; max. cruising, 117 m.p.h.; initial climb, 810 ft./min.; normal range, 225 mls., max., 440 mls. **Dimensions:** Span, 32 ft.; length, 23 ft. 2½ in.; height, 8 ft. 3 in.; wing area, 164 sq. ft.



AUSTER A.O.P.6

The A.O.P.6 and the externally identical T.7 with dual controls are currently serving with a number of foreign air arms. The A.O.P.6 first appeared in 1945, and 296 were supplied to the R.A.F., some of these later being passed to the Belgian Air Force. Ex-Army A.O.P.6s are being extensively modified for civil use under the designation BEAGLE-Auster A.61 Terrier. The Auster T.7 is illustrated.

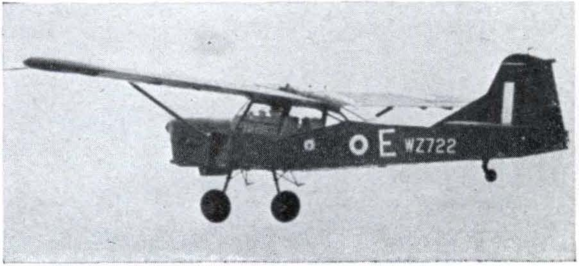
Nationality: British. **Type:** Air Observation Post Monoplane. **Power Plant:** One 145 h.p. de Havilland Gipsy Major 7 engine. **Weights:** Empty, 1,413 lb.; loaded, 2,160 lb. **Performance:** Max. speed, 124 m.p.h. at 1,000 ft.; cruising, 108 m.p.h.; initial climb, 810 ft./min. **Dimensions:** Span, 36 ft.; length, 23 ft. 9 in.; height, 8 ft. 4½ in.; wing area, 184 sq. ft.

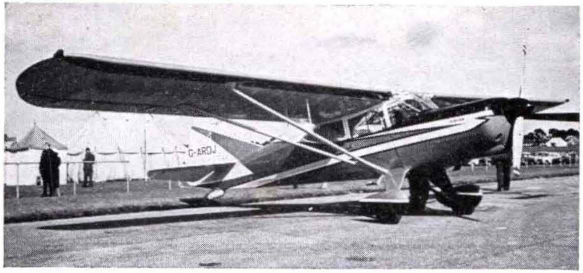


AUSTER A.O.P.9

Developed specifically for the Army Air Corps with higher performance and more elaborate equipment than earlier A.O.P. aircraft, the A.O.P.9 first flew on March 19, 1954, deliveries to the A.A.C. commencing in the following February. A.O.P.9s have been exported to the Indian and South African air forces and the Indian Army.

Nationality: British. **Type:** Air Observation Post Monoplane. **Power Plant:** One 173 h.p. Blackburn Cirrus Bombardier 203 engine. **Weights:** Empty, 1,590 lb.; loaded, 2,125 lb.; max., 2,330 lb. **Performance:** Max. speed, 127 m.p.h.; cruising, 110 m.p.h.; initial climb, 970 ft./min.; absolute ceiling, 19,500 ft.; range, 242 mls. **Dimensions:** Span, 36 ft. 5 in.; length, 23 ft. 8½ in.; height, 8 ft. 11 in.; wing area, 197·6 sq. ft.

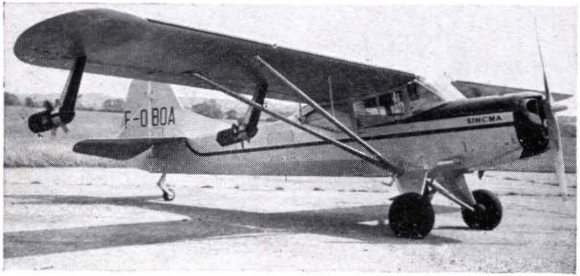




AUSTER D.6/180

The Auster "D" series of light aircraft appeared in the Spring of 1960. This series includes the two-seat D.4/108 (108 h.p. Lycoming O-235); the three-seat D.5/160 (160 h.p. Lycoming O-230), and the four-seat D.6/180 described and illustrated here. Metal wing spars replace the wooden spars of earlier Auster types, and all "D" models may be supplied with reduced wing span (32 ft.) resulting in increased level speed.

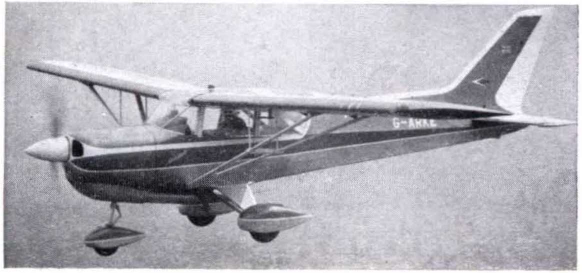
Nationality: British. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360 engine. **Weights:** Empty, 1,450 lb.; loaded, 2,500 lb. **Performance:** Max. speed, 138 m.p.h.; max. cruising, 133 m.p.h. at 5,000 ft.; initial climb, 850 ft./min.; range, 490 mls. at 133 m.p.h. **Dimensions:** Span, 36 ft.; length, 23 ft. 2 in.; height, 8 ft. 1 in.; wing area, 184·5 sq. ft.



AUSTER J1U WORKMASTER

Flown for the first time on February 22, 1958, the J1U Workmaster was developed specifically for agricultural duties, and the accompanying illustration shows the Workmaster fitted with Britten-Norman Micronair atomiser units. There is provision for a passenger seat behind the pilot in addition to the chemical container alongside the pilot's seat.

Nationality: British. **Type:** Two-seat Agricultural Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A engine. **Weights:** Max. loaded, 2,650 lb. **Performance:** Max. speed, 109 m.p.h. at 1,000 ft.; max. cruising, 93 m.p.h.; spraying speed, 60–80 m.p.h.; initial climb, 710 ft./min.; service ceiling, 13,700 ft.; normal range, 225 mls. **Dimensions:** Span, 32 ft.; length, 23 ft. 2 in.; height, 6 ft. 6 in.; wing area, 164 sq. ft.



BEAGLE-AUSTER A.109 AIREDALE

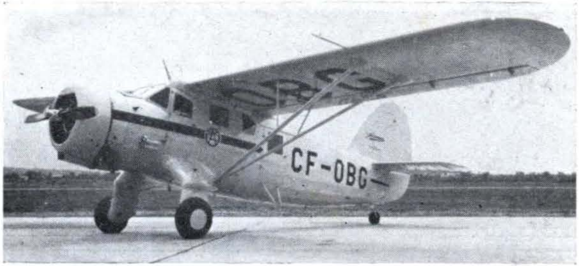
The A.109 Airedale, flown for the first time in April 1961, is the first in a new range of Auster light monoplanes. Appreciably more sophisticated than its predecessors, the Airedale is one of the first British light aeroplanes to compare favourably with American types in interior layout, etc., and production deliveries began in mid-May 1961.

Nationality: British. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 180 h.p. Lycoming O-360-A1A engine. **Weights:** Empty, 1,630 lb.; loaded, 2,750 lb. **Performance:** Max. speed, 148 m.p.h.; max. cruising, 141 m.p.h. at 5,000 ft.; econ. cruising, 135 m.p.h. at 7,500 ft.; initial climb, 730 ft./min; normal range, 650 mls. at 135 m.p.h. **Dimensions:** Span, 36 ft; length, 25 ft. 10 in.; height, 9 ft. 2 in.; wing area, 184·5 sq. ft.

C.C.F. NORSEMAN V

Designed by R. B. Noorduyn and first flown in 1935, the Norseman remained in production in various forms for a quarter of a century. The most widely used version is the Norseman V built by the Canadian Car and Foundry, but substantial numbers of Norseman IVs, 759 of which were built during the war years for the U.S.A.A.F. as the C-64, are also flying.

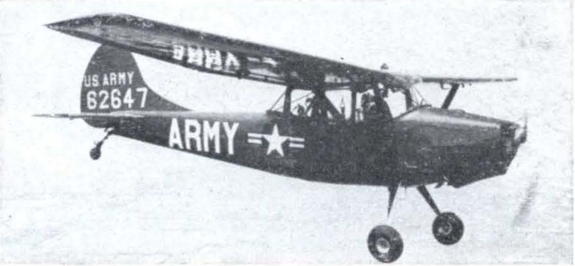
Nationality: Canadian. **Type:** General-purpose Light Transport. **Power Plant:** One 600 h.p. Pratt and Whitney R-1340-S3H1 radial. **Accommodation:** 7–8 passengers. **Weights:** Empty, 4,240 lb.; loaded, 7,400 lb. **Performance:** Max. speed, 155 m.p.h.; cruising, 141 m.p.h.; range (at econ. cruising), 464 mls.; service ceiling, 17,000 ft. **Dimensions:** Span, 51 ft. 8 in.; length, 32 ft. 4 in.; height, 10 ft. 1 in.; wing area, 325 sq. ft.



CESSNA L-19 BIRD DOG

The Bird Dog was the winner of a liaison and observation monoplane competition held by the U.S. Army in April 1950, and 3,259 aircraft of this type had been delivered when production terminated in January 1959. The principal versions were the L-19A (illustrated), the TL-19D dual-control instrument trainer, and the L-19E which has been built under licence in Japan, and currently serves with France's A.L.A.T., and the Canadian Army.

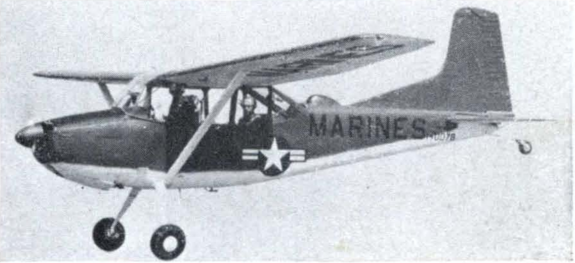
Nationality: American. **Type:** Two-seat Liaison and Observation Post Monoplane. **Power Plant:** One 214 h.p. Continental O-470-11 engine. **Weights:** Empty, 1,614 lb.; loaded, 2,430 lb. **Performance:** Max. speed, 115 m.p.h.; cruising, 104 m.p.h.; initial climb, 1,150 ft./min.; range, 530 mls. **Dimensions:** Span, 36 ft.; length, 35 ft. 10 in.; height, 7 ft. 4 in.; wing area, 174 sq. ft.

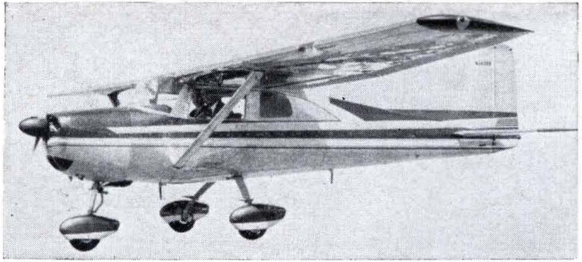


CESSNA OE-2

The U.S. Marine Corps received sixty L-19A Bird Dog monoplanes under the designation OE-1. These were followed by twenty-five OE-2s which, although of similar overall configuration to the OE-1, were in fact of entirely new design. Pilot and observer are protected from ground fire by flak curtains and seat armour, and two 250-lb. bombs may be carried underwing.

Nationality: American. **Type:** Two-seat Reconnaissance Monoplane. **Power Plant:** One 265 h.p. Continental O-470-2 engine. **Weights:** Empty, 1,853 lb.; loaded, 2,650 lb. **Performance:** Max. speed, 185 m.p.h.; initial climb, 1,300 ft./min.; service ceiling, 22,350 ft.; time to 20,000 ft., 22·6 min.; range, 575 mls. at 10,000 ft. **Dimensions:** Span, 36 ft.; length, 26 ft. 3 in.; height, 7 ft. 10 in.; wing area, 174 sq. ft.

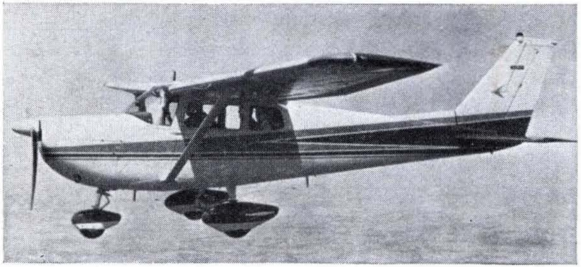




CESSNA MODEL 150

Available in standard, trainer, and inter-city commuter versions, the Model 150 was introduced in 1959, marking Cessna's re-entry into the two-seat light aircraft market. More than 1,000 Model 150s had been sold by the end of 1960. The trainer variant has dual controls as standard equipment, and a so-called "patroller" version has increased fuel capacity, a message chute, and a glass panel at the bottom of each door.

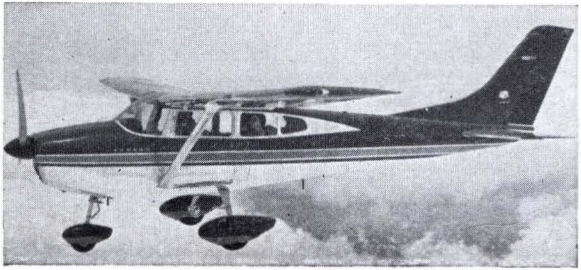
Nationality: American. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 100 h.p. Continental O-200-A engine. **Weights:** Empty, 962 lb.; loaded, 1,500 lb. **Performance:** Max. speed, 124 m.p.h. at sea level; cruising (70% power), 121 m.p.h. at 9,000 ft.; econ. cruising, 95 m.p.h. **Dimensions:** Span, 33 ft. 4 in.; length, 21 ft. 11 in.; height, 6 ft. 11 in.; wing area, 160 sq. ft.



CESSNA MODEL 175A (SKYLARK)

The Model 175A and Model 172A are basically similar apart from the power plant, the latter having a 145 h.p. Continental O-300-C engine. The Model 175A features several design refinements, including a free-blown windscreen, glass-fibre speed fairings, etc., but both models feature swept vertical tail surfaces introduced on the 1961 versions. The Skylark (illustrated) is a de luxe version of the Model 175A to which the specification refers.

Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 175 h.p. Continental GO-300-C engine. **Weights:** Empty, 1,339 lb.; loaded, 2,350 lb. **Performance:** Max. speed, 147 m.p.h.; max. cruising, 140 m.p.h.; econ. cruising, 105 m.p.h.; initial climb, 850 ft./min. **Dimensions:** Span, 36 ft.; length, 26 ft. 6 in.; height, 8 ft. 11 in.; wing area, 174 sq. ft.



CESSNA MODEL 182C (SKYLANE)

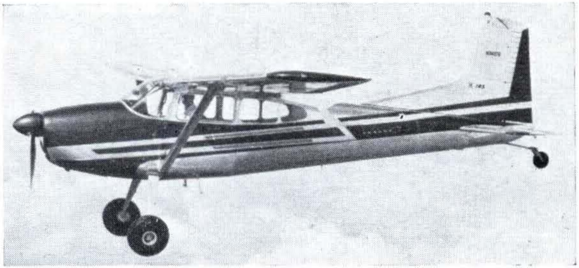
The Model 182C is a development of the Model 180C from which it differs primarily in having a nosewheel undercarriage in place of the Cessna patented tailwheel type landing gear, and swept vertical tail surfaces. A de luxe version of the Model 182C is known as the Skylane, this variant being equipped with full blind-flying instrumentation and other refinements.

Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 230 h.p. Continental O-470-L engine. **Weights:** Empty, 1,550 lb.; loaded, 2,650 lb. **Performance:** Max. speed, 167 m.p.h.; max. cruising, 157 m.p.h. at 8,000 ft.; econ. cruising, 118 m.p.h.; initial climb, 1,030 ft./min.; service ceiling, 19,800 ft.; range, 660 mls. **Dimensions:** Span, 36 ft.; length, 27 ft. 1 in.; height, 9 ft. 9 in.; wing area, 174 sq. ft.

CESSNA MODEL 185 SKYWAGON

Announced in October 1960, the Model 185 Skywagon is a six-seat utility aircraft evolved from the basic Model 180 design. Featuring a strengthened structure to suit it for cargo hauling and agricultural work, the Skywagon can be fitted with floats or skis, and production deliveries began in the spring of 1961. Five interior arrangements are available to meet individual requirements.

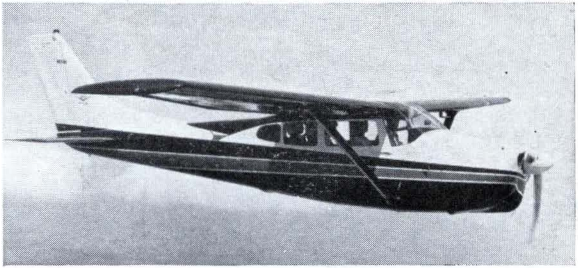
Nationality: American. **Type:** Six-seat Utility Monoplane. **Power Plant:** One 260 h.p. Continental IO-470-F engine. **Weights:** Empty, 1,520 lb.; loaded, 3,200 lb. **Performance:** Max. speed, 176 m.p.h. at sea level; max. cruising (70% power), 165 m.p.h. at 8,000 ft.; initial climb, 1,000 ft./min.; service ceiling, 17,300 ft.; max. range, 885 mls. **Dimensions:** Span, 36 ft.; length, 26 ft. 2 in.; height, 7 ft. 6½ in.; wing area, 174 sq. ft.



CESSNA MODEL 210

Following the basic formula of the Cessna series of all-metal high-wing monoplanes, the Model 210 was flown for the first time in the January of 1957, and was the first aircraft in the Cessna range to introduce the swept vertical tail. Intended to fill the gap between the Model 182C and Model 310, the Model 210 has a fully retractable undercarriage, the main members rotating around their attachment points, swivelling upwards and backwards.

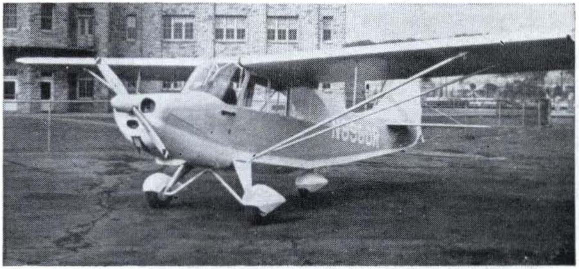
Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 260 h.p. Continental IO-470-E engine. **Weights:** Empty, 1,735 lb.; loaded, 2,900 lb. **Performance:** Max. speed, 199 m.p.h. at sea level; econ. cruising, 137 m.p.h. **Dimensions:** Span, 36 ft. 7 in.; length, 27 ft. 9 in.; height, 8 ft. 8½ in.; wing area, 175·5 sq. ft.

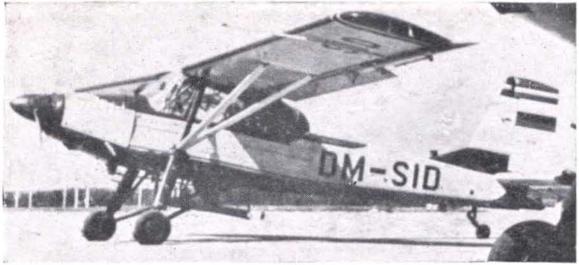


CHAMPION MODEL 7JC TRI-CON

Introduced in April 1960 by Champion Aircraft, the Tri-Con is the latest variant of the Model 7 Champion, manufacture of which was taken over from the Aeronca company in 1954. The 7EC Traveller and 7FC Tri-Traveller differ from the Tri-Con in having a tailwheel and nosewheel undercarriage respectively, the Tri-Con having a reverse tricycle undercarriage. The Sky-Trac and Challenger are externally similar three-seaters with 140 h.p. Lycoming O-290-D2B and 150 h.p. Lycoming O-320-A engines.

Nationality: American. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 95 h.p. Continental C90-12F. **Weights:** Loaded, 1,450 lb. **Performance:** Max. speed, 138 m.p.h. **Dimensions:** Span, 33 ft. 5 in.; length, 21 ft. 8 in.; height, 7 ft. 6 in.; wing area, 170 sq. ft.

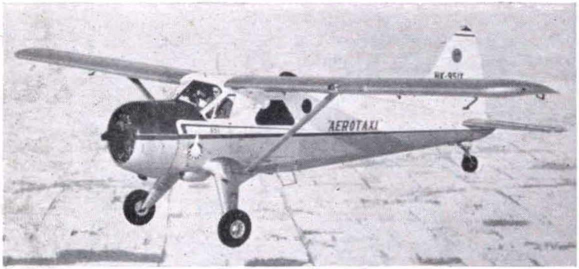




C.Z.L. L-60 BRIGADYR

Development of the Brigadyr was initiated in 1952, and this multi-purpose aircraft has since been manufactured in substantial numbers for both civil and military rôles. The Brigadyr is widely used for agricultural duties and in the ambulance rôle, and it serves with the Czech Air Force as a liaison aircraft. An experimental version with single bracing struts was designated L-160. The agricultural version is also known as the Agricolta.

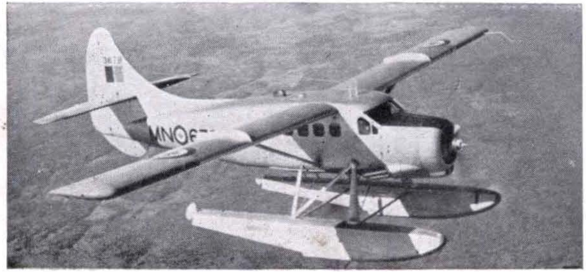
Nationality: Czechoslovak. **Type:** Four-seat Utility Monoplane. **Power Plant:** One 220 h.p. Praga Doris M-208B engine. **Weights:** Empty, 2,134 lb.; loaded, 3,439 lb. **Performance:** Max. speed, 120 m.p.h.; cruising, 109 m.p.h.; range, 447 mls. at 3,280 ft.; service ceiling, 13,780 ft. **Dimensions:** Span, 45 ft. 9½ in.; length, 28 ft.; height, 8 ft. 11 in.; wing area, 261·6 sq. ft.



DE HAVILLAND DHC-2 BEAVER

Flown for the first time on August 16, 1947, the Beaver has since been in continuous production and is serving in both military and civil rôles in some fifty countries. The Beaver serves extensively with the U.S.A.F. and U.S. Army as the L-20A and L-20 respectively, nearly 1,000 Beavers having been delivered to these services, and total production exceeds 1,500.

Nationality: Canadian. **Type:** Seven-seat Utility Transport. **Power Plant:** One 450 h.p. Pratt and Whitney R-985 Wasp Junior radial. **Weights:** Empty, 2,850 lb.; loaded, 5,100 lb. **Performance:** Max. speed, 163 m.p.h. at 5,000 ft.; cruising, 143 m.p.h.; initial climb, 1,020 ft./min.; service ceiling, 18,000 ft.; range, 455 mls. at 5,000 ft. **Dimensions:** Span, 48 ft.; length, 30 ft. 3 in.; height, 9 ft.; wing area, 250 sq. ft.



DE HAVILLAND DHC-3 OTTER

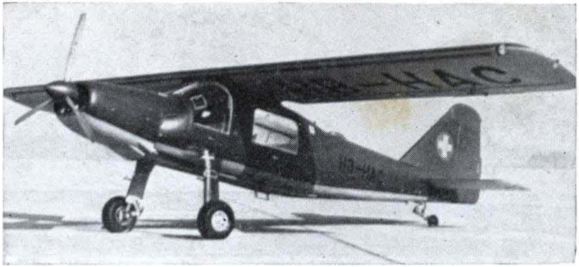
Several hundred Otters have been produced since the prototype flew for the first time on December 12, 1951, sixty-six of these having been delivered to the R.C.A.F., 223 being delivered to the U.S. Army as the U-1A, and four being delivered to the U.S. Navy as the UC-1. The Otter also serves with the air arms of Burma, Chile, Colombia, Ghana, India, Indonesia and Norway.

Nationality: Canadian. **Type:** Utility Transport. **Power Plant:** One 600 h.p. Pratt and Whitney R-1340-S1H1-G or S3H1-G radial. **Weights:** Empty, 4,168 lb.; loaded, 8,000 lb. **Performance:** Max. speed, 160 m.p.h.; cruising, 138 m.p.h. at 5,000 ft.; initial climb, 735 ft./min.; max. range, 960 mls. at 102 m.p.h. at 5,000 ft. **Dimensions:** Span, 58 ft.; length, 41 ft. 10 in.; height, 12 ft. 7 in.; wing area, 375 sq. ft.

DORNIER DO 27H-2

The Do 27H-2 is the most powerful of several civil and military variants of the basic Do 27 design. Four hundred and twenty-eight Do 27A and B monoplanes (the latter having dual controls) were ordered for the Luftwaffe and the Heeres-Luftfarzeuge. A six-seat civil version (270 h.p. Lycoming GO-480-B1A6) is designated Do 27Q-1, and a four-seat model (230 h.p. Continental O-470-K) is designated Do 27Q-3.

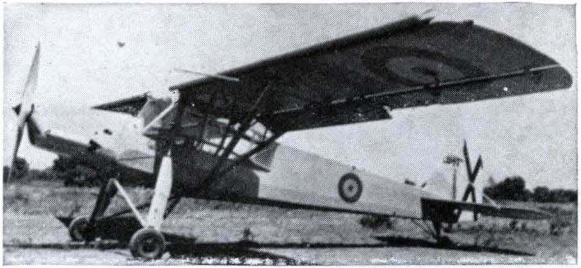
Nationality: German. **Type:** Six-seat Utility Monoplane. **Power Plant:** One 340 h.p. Lycoming GSO-480-B1B6 engine. **Weights:** Empty, 2,596 lb.; loaded, 4,070 lb. **Performance:** Max. speed, 174 m.p.h.; max. cruising, 146 m.p.h. at 8,200 ft.; range, 492 mls. at 138 m.p.h. **Dimensions:** Span, 39 ft. 4½ in; length, 32 ft. 5½ in.; height, 8 ft. 10¾ in.; wing area, 208·82 sq. ft.



FIESELER FI 156C-1 STORCH

Despite its age, the Storch (Stork) is still flying in substantial numbers. First flown in 1936, the Storch was built in large numbers during the war years as a liaison aircraft and air observation post, the most common sub-variants being the C-1 and C-2. It was manufactured in France by Morane-Saulnier as the M.S.500 (Argus As. 410C), M.S.501 (Renault 6Q) and M.S.502 (230 h.p. Salmson 9AB), and in Czechoslovakia as the Mraz Cáp.

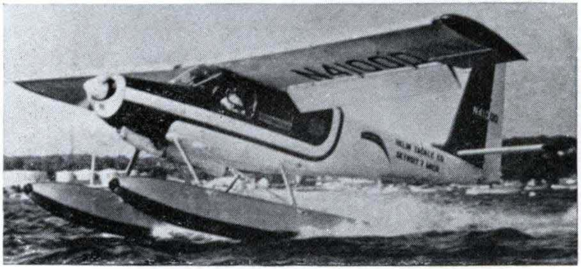
Nationality: German. **Type:** Three-seat General-purpose Monoplane. **Power Plant:** One 240 h.p. Argus As 410C. **Weights:** Empty, 2,134 lb.; loaded, 3,267 lb. **Performance:** Max. speed, 109 m.p.h.; cruising, 89 m.p.h.; range, 240 mls. **Dimensions:** Span, 46 ft. 9 in.; length, 32 ft. 6 in.; height, 10 ft.; wing area, 279·7 sq. ft.

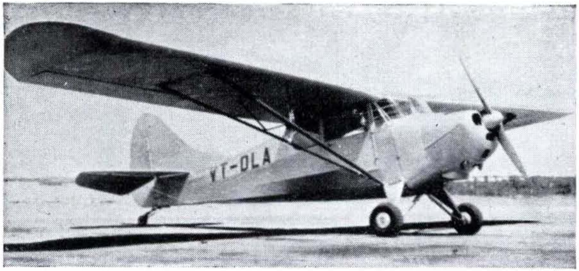


HELIO H-391B COURIER

Derived from the Koppen-Bollinger Helioplane of 1949, the H-391B Courier (illustrated in its floatplane form) has been built in some numbers, and developments of the basic design include the H-392 Strato-Courier with a 340 h.p. Lycoming GSO-480-A1A6 engine, and the H-395 Super Courier with a 295 h.p. Lycoming GO-480-C1D6.

Nationality: American. **Type:** Five-seat Cabin Monoplane. **Power Plant:** One 260 h.p. Lycoming GO-435-C2B2-6 engine. **Weights:** Empty, 1,960 lb.; loaded, 3,000 lb. **Performance:** Max. cruising, 162 m.p.h. at 8,500 ft.; econ. cruising, 145 m.p.h.; initial climb, 1,125 ft./min.; service ceiling, 23,100 ft.; normal range, 582 mls. **Dimensions:** Span, 39 ft.; length, 30 ft.; height, 8 ft. 10 in.; wing area, 231 sq. ft.

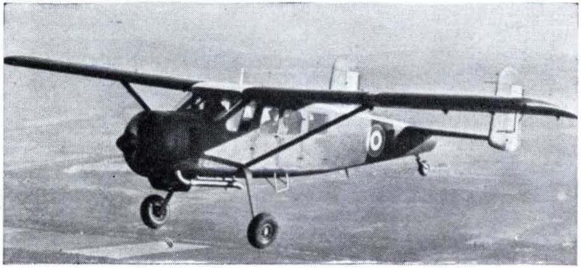




HINDUSTAN PUSHPAK

Currently in production for Indian flying clubs and private owners, the Pushpak was flown for the first time on September 28, 1958, the initial production series being powered by the imported Continental engine. Later machines are to receive the indigenous Hindustan PE-95 engine of similar power. A more powerful, three/four-seat development, the Krishak, is currently under test.

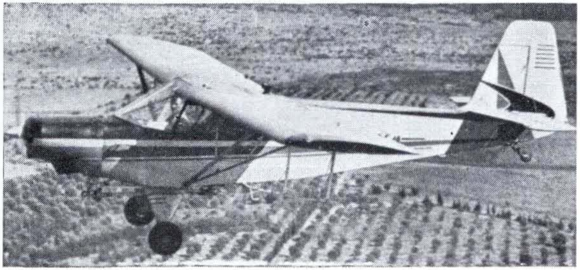
Nationality: Indian. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C90-12F engine. **Weights:** Empty, 870 lb.; loaded, 1,350 lb. **Performance:** Max. speed, 90 m.p.h.; max. cruising, 85 m.p.h.; econ. cruising, 70 m.p.h.; initial climb, 500 ft./min. **Dimensions:** Span, 36 ft.; length, 21 ft.; height, 9 ft. 1 in.; wing area, 175 sq. ft.



MAX HOLSTE M.H.1521M BROUSSARD

Employed extensively by the Armée de l'Air and A.L.A.T. as a utility transport, the Broussard flew for the first time on November 17, 1952, and 335 machines were ordered for the French armed forces. Several have also been supplied to the Royal Moroccan Air Force. A modified version of the Broussard with double-slotted wing flaps and full-span leading-edge slots is designated M.H.1522.

Nationality: French. **Type:** Six-seat Utility Transport. **Power Plant:** One 450 h.p. Pratt and Whitney R-985-AN Wasp radial. **Weights:** Empty, 3,637 lb.; loaded, 5,953 lb. **Performance:** Max. speed, 161 m.p.h.; econ. cruising, 143 m.p.h.; initial climb, 785 ft./min.; range, 745 mls. **Dimensions:** Span, 45 ft. 1 in.; length, 28 ft. $2\frac{1}{2}$ in.; height, 9 ft. 2 in.; wing area, 273·4 sq. ft.



I.A.46 RANQUEL

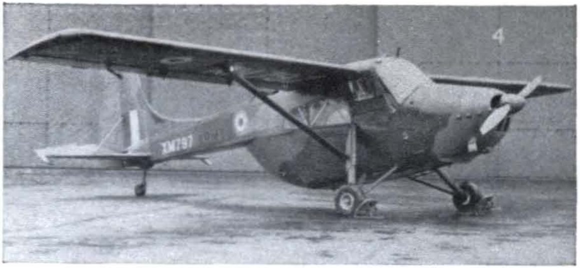
Designed primarily for agricultural purposes, the Ranquel was flown for the first time on December 23, 1957, and a pre-production series of fourteen aircraft was completed early in 1960. A production batch of 100 machines is currently nearing completion. Normally a 110 Imp. gal. chemical tank is installed behind the pilot, but this may be removed to provide accommodation for two passengers.

Nationality: Argentinian. **Type:** Single-seat Agricultural Aircraft or Three-seat Tourer. **Power Plant:** One 150 h.p. Lycoming O-320 engine. **Weights:** Empty, 1,232 lb.; loaded, 2,046 lb. **Performance:** Max. speed, 119 m.p.h.; cruising, 105 m.p.h.; initial climb, 710 ft./min. **Dimensions:** Span, 38 ft. $0\frac{3}{4}$ in.; length, 24 ft. 5 in.; height, 7 ft. $0\frac{3}{4}$ in.; wing area, 193·7 sq. ft.

LANCASHIRE PROSPECTOR MK. 1

Derived from the Edgar Percival E.P.9 which flew for the first time on December 21, 1955, the Prospector is a general utility aeroplane suitable for agricultural, ambulance or freighter rôles. The Prospector Mk. 2 is powered by a 410 h.p. Armstrong Siddeley Cheetah 10 radial engine, and a floatplane version of the basic design is currently projected.

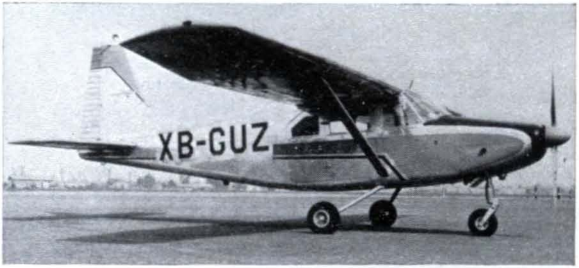
Nationality: British. **Type:** Six-seat Utility Monoplane. **Power Plant:** One 295 h.p. Lycoming GO-480-G1A6 engine. **Weights:** Empty, 2,072 lb.; loaded, 3,700 lb.; max., 4,320 lb. **Performance:** Max. speed, 146 m.p.h. at sea level; max. cruising, 128 m.p.h.; econ. cruising, 105 m.p.h. at 2,000 ft.; initial climb, 960 ft./min.; range, 580 mls. **Dimensions:** Span, 43 ft. 6 in.; length, 29 ft. 9 in.; height, 8 ft. 9 in.; wing area, 227·6 sq. ft.



LOCKHEED LASA-60 (SANTA MARIA)

The LASA-60, also known as the CL-402, was designed and built to a specification prepared by General Juan Azcarate by Lockheed's Georgia Division, and flown for the first time on September 15, 1959. Production is being undertaken in Mexico by Lockheed-Azcarate S.A., the first Mexican-built LASA-60 flying on March 21, 1961, and in Italy by Aeronautica Macchi S.A. The Macchi-built model is known as the Santa Maria.

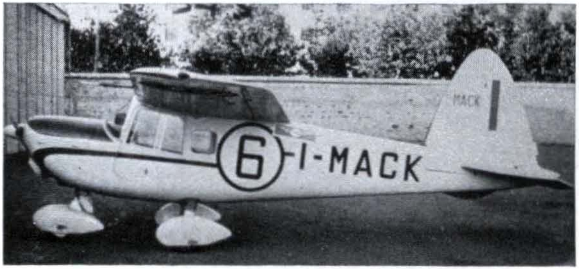
Nationality: American. **Type:** Four/six-seat Utility Aircraft. **Power Plant:** One 260 h.p. Continental TSIO-470 engine. **Weights:** Empty, 2,024 lb.; loaded, 3,532 lb.; max., 3,752 lb. **Performance:** Max. speed, 167 m.p.h. at 15,000 ft.; econ. cruising, 130 m.p.h.; initial climb, 930 ft./min. **Dimensions:** Span, 39 ft. 4 in.; length, 28 ft. 1 in.; height, 10 ft. 8 in.; wing area, 210 sq. ft.

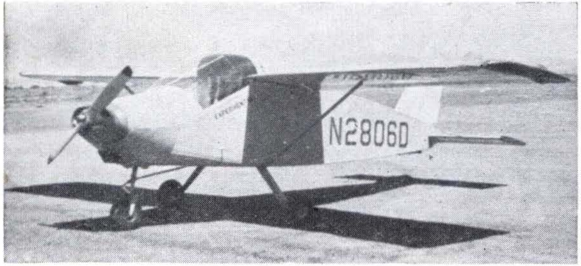


MACCHI M.B.308G

The M.B.308 first entered production in 1947 as a two-seater with 85 h.p. or 90 h.p. Continental C-85 or C-90 engines, and eighty aircraft of this type were purchased by the Italian Air Force, these subsequently being leased to aero clubs. The three-seat M.B.308G, the definitive production model, is currently manufactured under licence in Argentina by German Bianco S.A., the first Argentine-built aircraft flying in 1959.

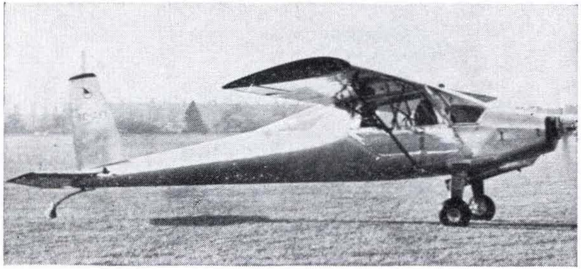
Nationality: Italian. **Type:** Three-seat Cabin Monoplane. **Power Plant:** One 90 h.p. Continental C90 engine. **Weights:** Empty, 948 lb.; loaded, 1,610 lb. **Performance:** Max. speed, 126 m.p.h.; max. cruising, 106 m.p.h.; service ceiling, 13,120 ft.; max. range, 445 mls., (max. payload), 370 mls. **Dimensions:** Span, 32 ft. 9½ in.; length, 21 ft. 5 in.; height, 9 ft.; wing area, 147·6 sq. ft.





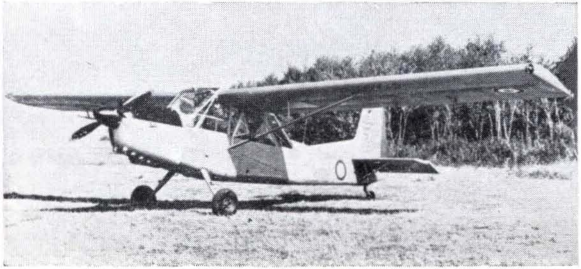
MFI-9 JUNIOR

The Junior, which is being produced by the A. B. Malmö Flygindustri, was designed by Björn Andreasson, and the prototype, originally known as the BA-7, was built and tested in the U.S.A. before being shipped to Sweden. Of simplified all-metal construction, the prototype Junior flew for the first time on October 10, 1958, and production deliveries are scheduled to begin in 1961. **Nationality:** Swedish. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 100 h.p. Continental O-200-A engine. **Weights:** Empty, 660 lb.; loaded, 1,200 lb. **Performance:** Max. speed, 149 m.p.h.; max. cruising, 140 m.p.h.; initial climb, 984 ft./min.; range (at econ. cruising), 600 mls. **Dimensions:** Span, 24 ft. 4⅛ in.; length, 18 ft. 5 in.; height, 6 ft. 2¾ in.; wing area, 93·646 sq. ft.



MFI-10 VIPAN

Flown for the first time on February 25, 1961, the Vipan (Peewit) employs revolutionary constructional methods and materials, the entire structure being of metal honeycomb sandwich, and the continuous one-piece cantilever undercarriage being of glass fibre. Designed to meet the requirements of the Royal Swedish Aero Club, the Vipan is also intented for the air observation post rôle, and two prototypes have been ordered by the Swedish Army. **Nationality:** Swedish. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 160 h.p. Lycoming O-320-B2B engine. **Weights:** Empty, 1,157 lb.; loaded, 2,205 lb. **Performance:** Cruising speed (60% power), 122 m.p.h.; initial climb, 984 ft./min. **Dimensions:** Span, 35 ft. 1½ in.; length, 26 ft. 1¾ in.; height, 6 ft. 5 in.; wing area, 169 sq. ft.



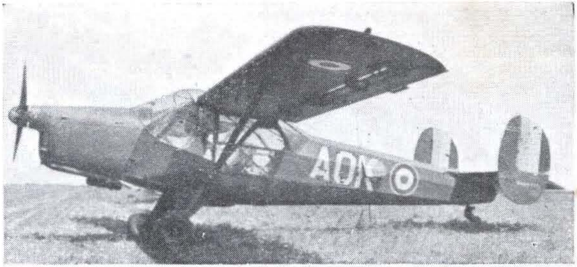
NORD 3400

Designed to meet the requirements of a 1956 contest for an observation, liaison and close-support aircraft for France's A.L.A.T., the Nord 3400 flew on January 20, 1958, and 150 aircraft were ordered, production being completed in March 1961. Design features include inboard slotted camber-changing flaps, split flaps under the ailerons, and a simple method of wing folding permitting the aircraft to be transported by road. **Nationality:** French. **Type:** Two/three-seat Observation and Utility Monoplane. **Power Plant:** One 260 h.p. Potez 4D.34 engine. **Weights:** Empty, 2,110 lb.; normal loaded, 2,866 lb. **Performance:** Max. speed, 146 m.p.h.; cruising, 124 m.p.h.; initial climb, 1,378 ft./min.; range, 620 mls. **Dimensions:** Span, 42 ft. 11¾ in.; length, 27 ft. 8¾ in.; height, 10 ft. 3¼ in.

NORD N.C.856A NORVIGIE

Derived from the civil N.C.856 tourer, the Norvigie has now been largely relegated to the training rôle in A.L.A.T., its air observation post rôle having been taken over by the Nord 3400. The first military prototype flew on March 15, 1951, and 112 aircraft were subsequently built, the first production Norvigie flying on March 12, 1953.

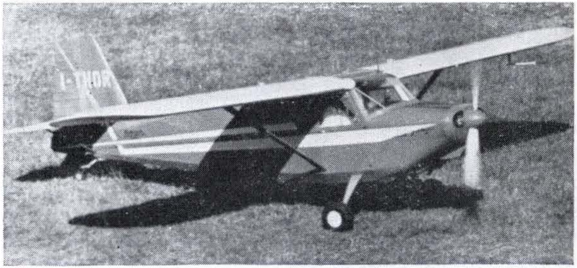
Nationality: French. **Type:** Two-seat Air Observation Post and Training Monoplane. **Power Plant:** One 135 h.p. SNECMA-Régnier 4LO-4 engine. **Weights:** Empty, 1,430 lb.; normal loaded, 1,947 lb.; max., 2,300 lb. **Performance:** Max. speed, 118 m.p.h.; cruising, 105 m.p.h.; initial climb, 984 ft./min.; endurance (liaison rôle), 3 hrs. **Dimensions:** Span, 41 ft.; length, 25 ft. 3 in.; height, 7 ft. 4½ in.; wing area, 183 sq. ft.



PARTENAVIA P.59 JOLLY

The Jolly was designed to compete with the Scricciolo for selection by the Italian Aero Club as a standard club training and touring aircraft. The Jolly was flown for the first time on February 2, 1960, and possesses a close family resemblance to the four-seat P.57 Fachiro II which has a fixed nosewheel undercarriage and a 168 h.p. Lycoming O-360 engine. Despite the selection of the Scricciolo, Partenavia propose to start production of the Jolly.

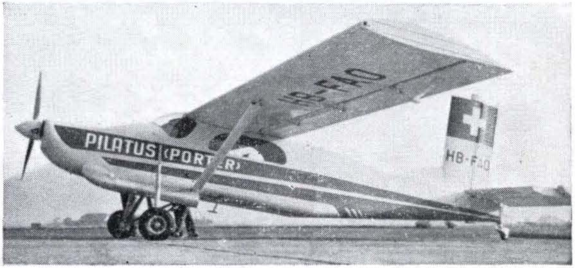
Nationality: Italian. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 95 h.p. Continental C90-12F. **Weights:** Empty, 1,058 lb.; loaded, 1,565 lb. **Performance:** Max. speed, 121 m.p.h.; cruising, 109 m.p.h.; range, 503 mls. **Dimensions:** Span, 30 ft. 2⅛ in.; length, 21 ft. 6¼ in.; height, 6 ft. 11½ in.; wing area, 153·493 sq. ft.

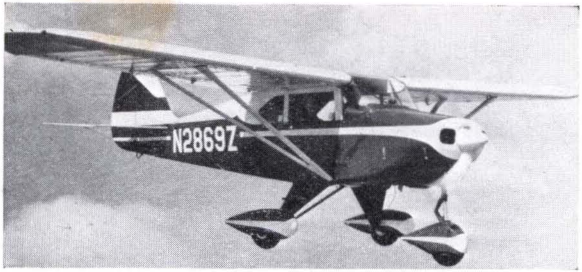


PILATUS P.C.6 PORTER

Flown for the first time on May 4, 1959, the Porter can be fitted with a combination wheel and ski landing gear or twin floats, and the first production machine was flown in August 1960. The Porter can be adapted for ambulance duties with two stretchers and attendants, aerial photography, supply dropping, and agricultural duties.

Nationality: Swiss. **Type:** Six/seven-seat Utility Aircraft. **Power Plant:** One 340 h.p. Lycoming GSO-480 engine. **Weights:** Empty, 2,425 lb.; loaded, 3,970 lb. **Performance:** Max. speed, 145 m.p.h.; max. cruising, 135 m.p.h.; econ. cruising, 120 m.p.h.; initial climb, 1,140 ft./min.; ceiling, 23,950 ft.; max. range, 750 mls., (max. payload), 400 mls. **Dimensions:** Span, 49 ft. 10 in; length, 33 ft. 5½ in.; height, 10 ft. 6 in.; wing area, 306·8 sq. ft.

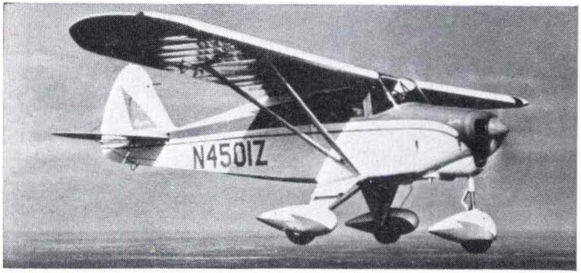




PIPER PA-22 CARIBBEAN (TRI-PACER)

The PA-22 Tri-Pacer was introduced in 1950 as a development of the PA-16 Clipper, and in November 1958, a variant of the Tri-Pacer known as the Caribbean (illustrated and described by the specification) was announced. Externally similar to the Tri-Pacer, the Caribbean is intended primarily for club use, and a 150 h.p. engine replaces the 160 h.p. Lycoming O-320-B. The structure of both types is identical.

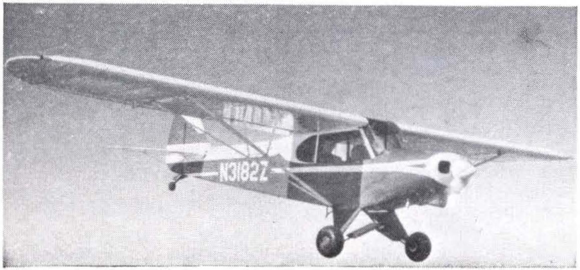
Nationality: American. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 150 h.p. Lycoming O-320-A2B engine. **Weights:** Empty, 1,100 lb.; loaded, 2,000 lb. **Performance:** Max. speed, 139 m.p.h.; cruising, 132 m.p.h. at 7,000 ft.; range, 528 mls.; initial climb, 725 ft./min. **Dimensions:** Span, 29 ft. 3½ in.; length, 20 ft. 7¼ in.; height, 8 ft. 3¾ in.; wing area, 147·5 sq. ft.



PIPER PA-22 COLT 108

Introduced in 1960 as a low-cost side-by-side two-seat version of the basic PA-22 design, the Colt closely resembles the Tri-Pacer (now discontinued) externally, and there is a high degree of component interchangeability, both types employing the same engine mount, undercarriage, windscreen and tail surfaces. The Colt is available in Standard Custom and Super Custom models with additional equipment.

Nationality: American. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 108 h.p. Lycoming O-235-C1B engine. **Weights:** Empty, 940 lb.; loaded, 1,650 lb. **Performance:** Max. speed, 120 m.p.h.; cruising (75% power), 109 m.p.h.; initial climb, 610 ft./min.; range, 324 mls. **Dimensions:** Span, 30 ft.; length, 20 ft.; height, 6 ft. 3 in.; wing area, 147 sq. ft.



PIPER PA-18 SUPER CUB 150

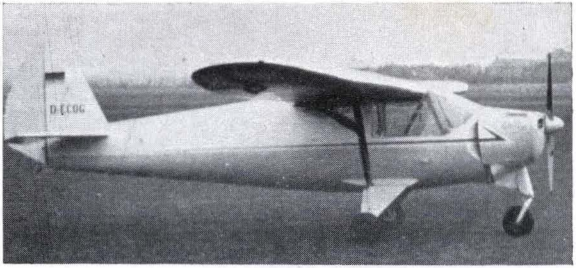
Introduced in 1950 as a development of the original Cub, the PA-18 Super Cub has since been manufactured in several versions, including military liaison variants such as the L-18B (90 h.p. Continental C90) and L-21B (135 h.p. Lycoming O-290-D2). There are currently two versions of the Super Cub 150, these being standard and de luxe models. The Super Cub 95 is identical apart from the power plant (95 h.p. Continental C90), and the PA-18-A is an agricultural model.

Nationality: American. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 150 h.p. Lycoming O-320 engine. **Weights:** Empty, 930 lb.; loaded, 1,750 lb. **Performance:** Max. speed, 130 m.p.h.; cruising, 115 m.p.h.; initial climb, 960 ft./min. **Dimensions:** Span, 35 ft. 3½ in.; length, 22 ft. 6 in.; height, 6 ft. 8½ in.

PUTZER ELSTER-B

Derived from the original Elster (Magpie) which, in turn, was developed from the Motorraab motorised version of the Doppelraab sailplane, the Elster-B has been selected for use by the Luftwaffe's sporting flying groups, production deliveries commencing in 1960. The Elster-B is suitable for towing sailplanes, and is primarily of wooden construction.

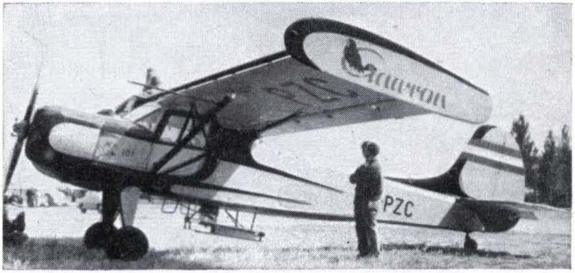
Nationality: German. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 95 h.p. Continental C90-12F engine. **Weights:** Empty, 1,012 lb.; loaded, 1,540 lb. **Performance:** Max. speed, 104 m.p.h.; cruising, 93 m.p.h.; initial climb, 720 ft./min.; service ceiling, 16,400 ft.; range (at econ. cruising speed), 280 mls. **Dimensions:** Span, 43 ft. 4½ in.; length, 23 ft. 3½ in.; height, 8 ft. 2½ in.; wing area, 188·368 sq. ft.



PZL-101 GAWRON

The Gawron (Rook) has been developed from the Russian Yak-12M which has been built under licence in Poland. The Gawron is an all-purpose agricultural machine which is being produced in two versions, the PZL-101G.1 intended specifically for agricultural rôles, and the PZL-101G.2 which may be adapted for freight and passenger transportation. The Gawron completed manufacturers' trials in the Spring of 1958.

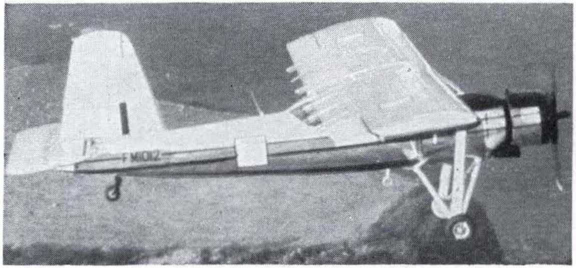
Nationality: Polish. **Type:** Agricultural and Four-seat Utility Monoplane. **Power Plant:** One 260 h.p. Ivchenko AI-14R radial. **Weights:** Empty, 2,119 lb.; loaded, 3,234 lb. **Performance:** Max. speed, 106 m.p.h.; cruising, 81–87 m.p.h.; initial climb, 492 ft./min.; range, 326 mls. **Dimensions:** Span, 41 ft. 4½ in.; length, 29 ft. 6½ in.; height, 10 ft. 3 in.; wing area, 256·8 sq. ft.

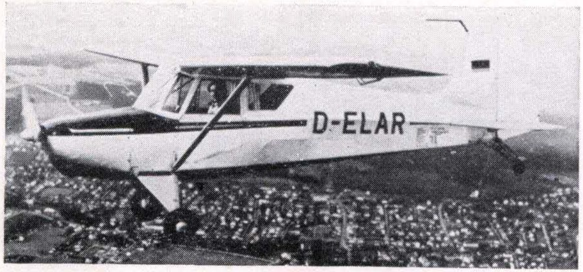


SCOTTISH AVIATION PIONEER C.C.1

Serving with the R.A.F., the R.Cy.A.F., the R.Mal.A.F., and the Sultan of Muscat's air arm, the Pioneer C.C.1 has been in service since August 1953, and fifty-three were built. The Pioneer first flew with the Leonides engine on May 5, 1950, and the first production aircraft flew on June 25, 1953. The Pioneer can operate from extremely confined spaces.

Nationality: British. **Type:** Five-seat Utility Aircraft. **Power Plant:** One 520 h.p. Alvis Leonides 502/7 radial. **Weights:** Empty, 4,230 lb.; loaded, 5,800 lb. **Performance:** Max. speed, 145 m.p.h. at 1,500 ft.; max. cruising, 142 m.p.h. at 6,700 ft.; econ. cruising, 114 m.p.h.; initial climb, 720 ft./min.; service ceiling, 16,000 ft.; max. range, 650 mls. **Dimensions:** Span, 49 ft. 9 in.; length, 34 ft. 4¾ in.; height, 11 ft. 4⅝ in.; wing area, 390 sq. ft.

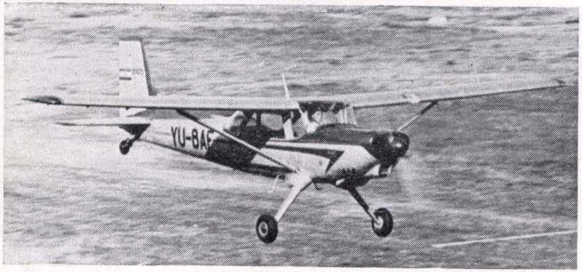




SCHEIBE SF-23C SPERLING

The Sperling (Sparrow) was flown for the first time on August 8, 1955, and the three production versions are the SF-23A/K1 (illustrated) with the 95 h.p. Continental C.90; the SF-23B with the 100 h.p. Continental O-200, and the more powerful SF-23C described by the specification. The SF-23C embodies a number of other modifications designed to improve performance and maintenance.

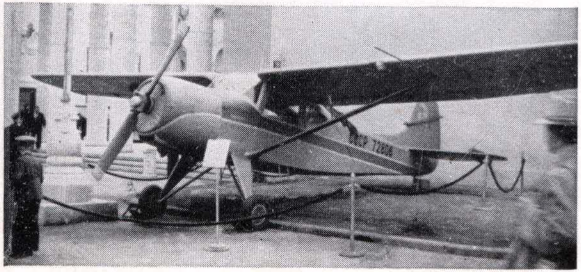
Nationality: German. **Type:** Two-seat Cabin Monoplane. **Power Plant:** One 115 h.p. Lycoming O-235-C1 engine. **Weights:** Empty, 1,060 lb.; loaded, 1,606 lb. **Performance:** Max. speed, 130 m.p.h.; cruising, 105 m.p.h.; initial climb, 770 ft./min.; range, 372 mls. **Dimensions:** Span, 32 ft. 7¼ in.; length, 20 ft. 4¾ in.; height, 7 ft. 1¾ in.; wing area, 131·3 sq. ft.



UTVA-56

The UTVA-56 utility aircraft was flown for the first time on April 22, 1959, and has since been placed in production by the Fabrika Aviona UTVA at Pancevo. Capable of being fitted with floats or skis, the UTVA-56 is of all-metal construction and is suitable for agricultural and ambulance rôles, and as a military liaison and air observation post aircraft.

Nationality: Yugoslav. **Type:** Four-seat Utility Monoplane. **Power Plant:** One 260 h.p. Lycoming GO-435-C2B2 engine. **Weights:** Loaded, 2,866 lb. **Performance:** Max. speed, 155 m.p.h.; max. cruising, 143 m.p.h.; econ. cruising, 112 m.p.h.; initial climb, 1,150 ft./min.; service ceiling, 16,400 ft.; normal range, 370 mls., max., 435 mls. **Dimensions:** Span, 37 ft. 4¾ in.; length, 27 ft. 3 in.; height, 8 ft. 6 in.; wing area, 194·61 sq. ft.



YAKOVLEV YAK-12A (CREEK-D)

Work on the Yak-12 began in 1944, and the type has since been manufactured in large numbers and in several versions. The initial three-seat production model was powered by a 145 h.p. M-11D or M-11FR, but in 1952, the Yak-12R appeared with the AI-14R engine. This was supplanted by the Yak-12M which differed in being entirely of metal construction, and the latest version is the Yak-12A (described and illustrated) with an entirely re-designed wing and other modifications.

Nationality: Russian. **Type:** Four-seat Cabin Monoplane. **Power Plant:** One 240 h.p. Ivchenko AI-14R radial. **Weights:** Empty, 2,330 lb.; loaded, 3,494 lb. **Performance:** Max. speed, 133 m.p.h.; cruising, 96 m.p.h.; range, 688 mls. **Dimensions:** Span, 41 ft. 3⅞ in.; length, 29 ft. 6⅓ in.; height, 10 ft. 2¾ in.

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